UNIVERSUM

VRP-4346

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SECTION1 SUMMARY

KEY TO ABBREVIATIONS

A	AC	Alternating Current
	ACC	Automatic Color Control
	ADJ	Adjust
	A/E	Audio Erase
	AFC	Automatic Frequency Control
	AFT	Automatic Fine Tuning
	AGC	Automatic Gain Control
	ALC	Automatic Level Control
	AM	Amplitude Modulation
	AMP	Amplifier
	ANT	Antenna
	APC	Automatic Phase Control
	ASS'Y	Assembly
	AUD	Audio
	AUTO	Automatic
	AUX	Auxiliary
B	B	Base
	BPF	Bandpass Filter
	BW or B/W	Black and White
C	C	Capacitor, Chroma, Collector
	CAN	Cancel
	CAP	Capstan
	CATV	Cable Television
	CBA	Circuit Board Assembly
	CCD	Charge Coupled Device
	CFG	Capstan Frequency Generator
	CH	Channel
	CHROMA	Chrominance
	CLK	Clock
	CNR	Chroma Noise Reduction
	COMB	Combination Comb Filter
	COMP	Comparator Composite Compensation
	CONV	Converter
	CS	Chip Select
	CST	Cassette
	CTL	Control
	CUR	Current
	CYL	Cylinder
D	D	Drum, Digital, Diode, Drain
	dB	Decibel
	DC	Direct Current
	DEMOD	Demodulator
	DET	Detector
	DEV	Deviation
	DHP	Double High Pass
	DIGITRON	Digital Display Tube
	DL	Delay Line
	DOC	Drop Out Compensator
	D/V	Dummy Vertical
E	E	Emitter
	EE	Electric to Electric
	EMP	Emphasis
	EP	Extended Play
	EQ	Equalizer
	ES	Electrostatically Sensitive
F	F	Fuse
	FB	Feed Back
	FBC	Feed Back Clamp
	FE	Full Erase
	FF	Fast Forward
	FG	Frequency Generator
	FL	Filter
	FM	Frequency Modulation
	F/R	Front/Rear
	FS	Frequency Synthesizer
	FSC	Subcarrier Frequency
	F/V	Frequency Voltage
	FWD	Forward
G	GEN	Generator
	GND	Ground
H	H	High, Horizontal
	Hz	Hertz
I	IC	Intergrated Circuit
	IF	Intermediate Frequency
	INS	Insert
	I/O	Input/Output
L	L	Low, Left, Coil
	LD	LED
	LECHA	Letter Character
	LP	Long Play
	LPF	Low Pass Filter
M	MAX	Maximum
	MD	Modulator
	MIC	Microphone
	MIN	Minimum
	MIX	Mixer, Mixing
	M M	Mono Multi Vibrator
	MMV	Monostable Multivibrator
	MOD	Modulation, Modulator
	MODEM	Modulator-Demodulator
N	NR	Noise Reduction
O	OSC	Oscillator
	OSD	On Screen Display
P	PB	Playback
	PCB	Printed Circuit Board
	PG	Pulse Generator
	PLL	Phase Locked Loop
	P-P	Peak-to-Peak
	PRE-AMP	Preamplifier
	PS	Phase Shift
	PWM	Pulse Width Modulation
Q	Q	Transistor
	QH	Quasi Horizontal
	QSR	Quick Setting Record
	QTR	Quick Timer Record
	QV	Quasi Vertical
R	R	Resistor, Right
	RE(or RC)	Remocon, Receiver
	REC	Recording
	REF	Reference
	REG	Regulated, Regulator
	REMOCON	Remote Control(unit)
	REV	Reverse
	REW	Rewind
	RF	Radio Frequency
	R/P	Record/Playback
	RTC	Real Time Counter
S	S	Serial
	SH	Shift
	SHARP	Sharpness
	SIF	Sound Intermediate Frequency
	SLD	Side Locking
	S/N	Signal to Noise Ratio
	SP	Standard Play
	SUB	Subtract, Subcarrier
	SW or S/W	Switch
	SYNC	Synchronization
	SYSCON	System Control
T	T	Coil
	TP	Test Point
	TR	Transistor
	TRK	Tracking
	TRANS	Transformer
	TU	Tuner, Take-Up
U	UHF	Ultra High Frequency
	UNREG	Unregulated
V	V	Volt, Vertical
	VA	Always Voltage
	VCO	Voltage Controlled Oscillator
	VGC	Voltage Gain Control
	VHF	Very High Frequency
	VISS	VHS Index Search
	VR	Variable Resistor or Volume
	V-Sync	Vertical Synchronization
	VTG	Voltage
	VV	Voltage to Voltage
	VXO	Voltage X-tal Oscillator
W	W	Watt
	WHT	White
	W/O	With Out
X	X-TAL	Crystal
Y	Y/C	Luminance/Chrominance
	YNR	Luminance Noise Reduction
Z	ZD	Zener Diode

IMPORTANT SAFETY PRECAUTIONS

Prior to shipment from the factory, the products are strictly inspected to conform with the recognized product safety and electrical codes of the countries in which they are to be sold. However, in order to maintain such compliance, it is equally important to implement the following precautions when a set is being serviced.

• Precautions during Servicing

1. Locations requiring special caution are denoted by labels and inscriptions on the cabinet, chassis and certain parts of the product. When performing service, be sure to read and comply with these and other cautionary notices appearing in the operation and service manuals.
2. Parts identified by the ⚠ symbol and shaded (■) parts are critical for safety. Replace only with specified part numbers.
   Note: Parts in this category also include those specified to comply with X-ray emission standards for products using cathode ray tubes and those specified for compliance with various regulations regarding spurious radiation emission.
3. Use Specified internal wiring. Note especially:
   1) Wires covered with PVC tubing
   2) Double insulated wires
   3) High voltage leads
4. Use specified insulating materials for hazardous live parts. Note especially:
   1) Insulation Tape
   2) PVC tubing
   3) Spacers
   4) Insulation sheets for transistor
5. When replacing AC primary side components (transformers, power cords, noise blocking capacitors, etc.) wrap ends of wires securely about the terminals before soldering.(Fig. 1)

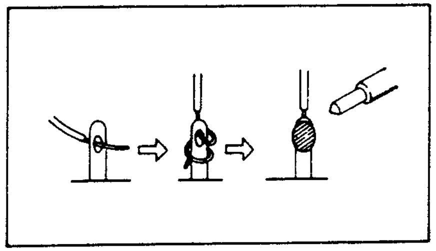


Fig. 1

6. Observe that wires do not contact heat producing parts (heatsinks, oxide metal film resistors, fusible resistors, etc.)
7. Check that replaced wires do not contact sharp edged or pointed parts.
8. When a power cord has been replaced, check that 10-15Kg of force in any direction will not loosen it.(Fig. 2)

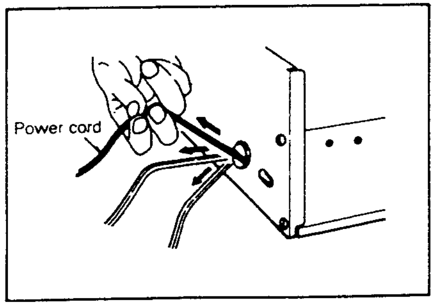


Fig. 2

9. Also check areas surrounding repaired locations.
10. Products using cathode ray tubes (CRTs)
    In regard to such products, the cathode ray tubes themselves, the high voltage circuits, and related circuits are specified for compliance with recognized codes pertaining to X-ray emission. Consequently, when servicing these products, replace the cathode ray tubes and other parts with only the parts specified. Under no circumstances attempt to modify these circuits. Unauthorized modification can increase the high voltage value and cause X-ray emission from the cathode ray tube.

SAFETY CHECK AFTER SERVICING

Examine the area surrounding the repaired location for damage or deterioration. Observe that screws, parts and wires have been returned to original positions. Afterwards, perform the following tests and confirm the specified values in order to verify compliance with safety standards.

• Insulation resistance test

Confirm the specified insulation resistance or greater between power cord plug prongs and externally exposed parts of the set (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.) See table below.

• Dielectric strength test

Confirm specified dielectric strength or greater between power cord plug prongs and exposed accessible parts of the set(RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.) See table below.

• Clearance distance

When replacing primary circuit components, confirm specified clearance distance (d), (d') between soldered terminals, and between terminals and surrounding metallic parts. See table below.

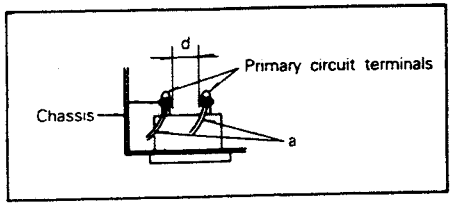


Fig. 3

Table 1:Ratings for selected areas

AC Line Voltage	Region	Insulation Resistance	Dielectric Strength	Clearance Distance(d),(d)
*110 to 130 V 200 to 240 V	Europe Australia	≧10 MΩ/500 V DC	4kV 1 minute	≧6mm(d) ≧8mm(d) (a Power cord)

*Class II model only.

Note This table is unofficial and for reference only. Be sure to confirm the precise values for your particular country and locality

• Leakage Current test

Confirm specified or lower leakage current between B(earth ground, power cord plug prongs) and externally exposed accessible parts (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.)

Measuring Method (Power ON)
Insert load Z between B(earth ground, power cord plug prongs) and exposed accessible parts. Use an AC voltmeter to measure across both terminals of load Z. See figure and following table.

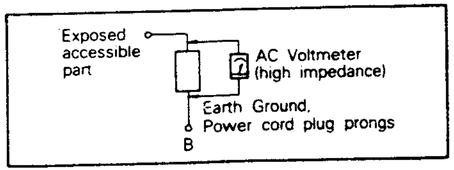

Exposed accessible part
Z
AC Voltmeter (high impedance)
Earth Ground, Power cord plug prongs
B

Fig. 4

Table 2:Leakage current ratings for selected areas

AC Line Voltage	Region	Load Z	Leakage Current(i)	Earth Ground (B) to:
100 to 130 V	Europe	2kΩ	i≦0.7m A peak i≦2m A dc	Antenna earth terminals
200 to 240 V	Australia	50kΩ	i≦0.7m A peak i≦2m A dc	Other terminals

Note This table is unofficial and for reference only. Be sure to confirm the precise values for your particular country and locality

INTRODUCTION

This service manual provides a variety of service information. It contains the mechanical structure of the Double Deck Video Cassette Recorder together with mechanical adjustments and the electronic circuits in schematic form. This Double Deck VCR was manufactured and assembled under our strict quality control standards and meets or exceeds industry specifications and standards.

FEATURES

- the VHS and 8 mm system with HQ-picture technology for extraordinary picture-sharpness and high resolution.
- the digital tracking automatic which makes the enjoying manual control obsolete.
- automatic power and playback.
- four VHS video heads for a clear still image and a variable slow motion.
- three 8 mm video heads for 8 mm playback only.
- assemble editing from 8 mm tape to VHS tape.
- the easy searching of your recordings by automatic and manual index marking, that can also be erased.
- the quick mechanism for fast tape function transitions.
- the long play VHS recording and playback facility.
- the real time tape counter and the VHS remaining tape time display.
- 8 timer programme memories, also for daily or weekly recurring recordings, within one year can be programmed at the same time.
- the on-screen display of many functions e.g. the stored timer programmes.
- and many more, like additional audio and video input at the front, Euro-AV sockets, audio dubbing, child lock, immediate recording timer, and title generator.
- TV Programmer, Digital Link.
- SHOWVIEW
  ShowView is a trademark applied for by Gemstar Development Corp.
  ShowView system is manufactured under license from Gemstar Development Corporation.

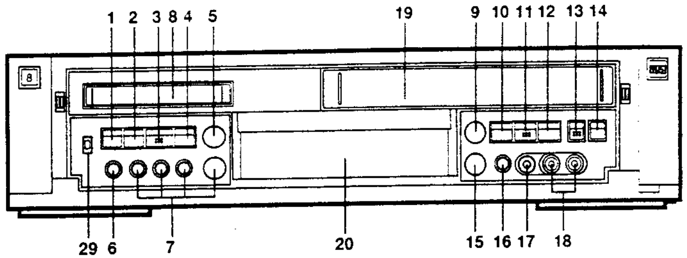
SPECIFICATIONS

General		
Power supply :		AC 230V(± 10%), 50Hz
Power consumption :		Approx. 45W
Cabinet size(W × H × D) :		430 × 99 × 390mm
Weight :		Approx. 8Kg
Operating temperature :		5° C to 35° C surrounding temperature
Operating humidity :		35-80%
8 mm Player section		
Format :		8 mm PAL Standard
Heads :		3 video heads
Tape speed :	(SP)	20.05 mm/sec.
	(LP)	10.025 mm/sec.
Tape width :		8 mm
Video output :		1 Vpp 75 ohm unbalanced
Audio output :		500 mV, <1 kohm
VHS Recorder section		
Format :		VHS PAL Standard
Heads :		4 video heads
Tape speed :	(SP)	23.39 mm/sec.
	(LP)	11.635 mm/sec.
Tape width :		12.7 mm
Video :		PAL B/G, SECAM-L
Recording/playback time :		300 min. (LP : 600 min.) with E-300
Aerial input :		PAL : VHF 2-12 (SECAM) UHF 21-69 CATV S1-S40
RF output :		UHF channels 32~40 (Variable)
Video input :		1 Vpp 75 ohm unbalanced
Video output :		1 Vpp 75 ohm unbalanced
S/N ratio (video) :		45dB nominal
Audio input :		500 mV, >50 kohm
Audio output :		500 mV, <1 kohm
S/N ratio (audio) :		45 dB nominal
Audio frequency range :		63-12,500 Hz nominal

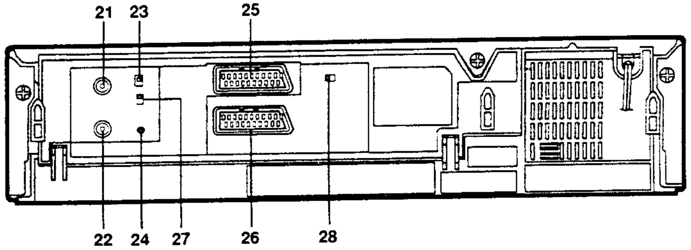
* Designs and specifications are subject to change without notice.

LOCATION OF CUSTOMER CONTROLS

FRONT



REAR



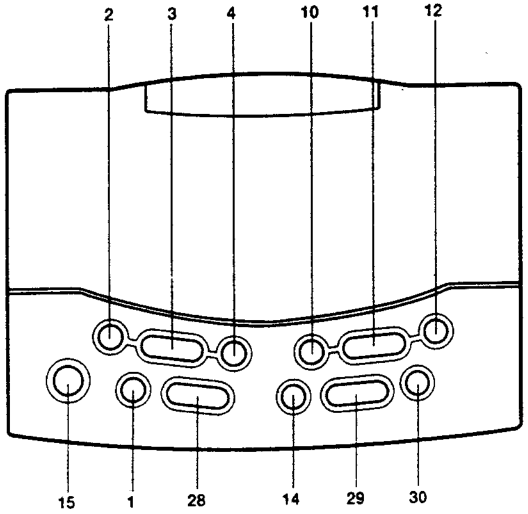
8 mm Player section

1. STILL BUTTON
2. REWIND/REVIEW BUTTON
3. PLAY BUTTON
4. FAST FORWARD/CUE BUTTON
5. STOP/EJECT BUTTON
6. V.INSERT BUTTON
7. ASSEMBLE EDITING BUTTONS
8. CASSETTE COMPARTMENT

VHS Recorder section

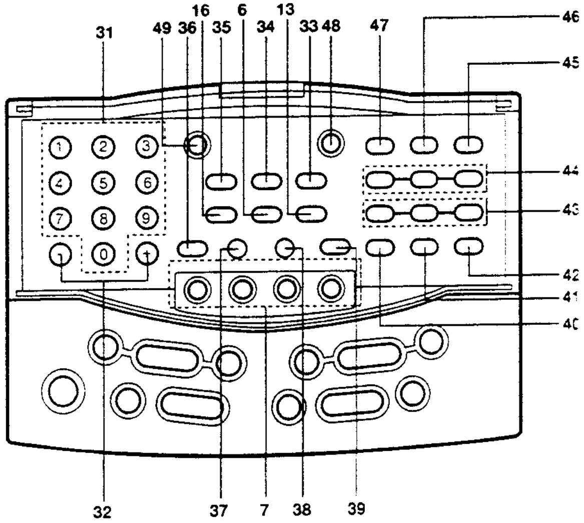
9. STOP/EJECT BUTTON
10. REWIND/REVIEW BUTTON
11. PLAY BUTTON
12. FAST FORWARD/CUE BUTTON
13. REC/QSR BUTTON
14. P/STILL BUTTON
15. OPERATE ON/OFF BUTTON
16. AUDIO DUBBING BUTTON
17. MIC IN JACK
18. AUDIO/VIDEO IN JACKS
19. CASSETTE COMPARTMENT
20. VCR DISPLAY
21. AERIAL INPUT SOCKET
22. RF OUT SOCKET
23. TPSG ON/OFF SWITCH
24. RF CHANNEL CONTROL
25. EURO-AV 1 SOCKET
26. EURO-AV 2 SOCKET
27. SYSTEM SELECT SWITCH
28. COLOR ON/OFF SWITCH
29. TV/VTR BUTTON

REMOTE CONTROL


2
3
4
10
11
12
15
1
28
14
29
30

1. STILL BUTTON
2. REWIND/REVIEW BUTTON
3. PLAY BUTTON
4. FAST FORWARD/CUE BUTTON
6. V. INSERT BUTTON
7. ASSEMBLE EDITING BUTTONS
10. REWIND/REVIEW BUTTON
11. PLAY BUTTON
12. FAST FORWARD/CUE BUTTON
13. REC/QSR BUTTON
14. P/STILL BUTTON
15. OPERATE ON/OFF BUTTON
16. AUDIO DUBBING BUTTON

28. STOP BUTTON
29. STOP BUTTON
30. FRAME ADVANCE BUTTON
31. NUMBER BUTTONS
32. PROG/TRK BUTTONS (+/−)
33. TAPE SPEED BUTTON
34. TU/AV BUTTON
35. MIC MIX BUTTON
36. AUTO TRACKING BUTTON
37. 8 mm RESET BUTTON
38. VHS RESET BUTTON


16
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13
31
49
36
35
34
33
48
47
46
45
44
43
42
41
40
1
2
3
4
5
6
7
8
9
0
32
37
7
38
39

39. REST BUTTON
40. MENU BUTTON
41. DISPLAY/PG. OUT BUTTON
42. CLEAR/PG. CLR BUTTON
43. SLOW/MFT BUTTONS
44. VISS BUTTONS
45. CHILD LOCK BUTTON
46. TV/VTR BUTTON
47. VPS BUTTON : *
48. SHOWVIEW BUTTON
49. MONITOR BUTTON

※ * : Optional Function

SECTION 2 CABINET & MAIN FRAME

SERVICE FIXTURE CONNECTING METHOD

1. SVC FIXTURE Connecting Method

A. FIXTURE Cable ① Connecting Method.

a) Connect the FIXTURE Cable ① between Main C.B.A and Junction C.B.A. (P2J01, P2J02, P2J03)

b) At this time, should be in the left side " ◄ LEFT" mark on the P.C.B of the FIXTURE Cable ①. (See Fig. 2-a, 2-c)

c) Connect the connector of "MAIN" mark of FIXTURE Cable ① with the Main C.B.A and the connector of "JUNCTION" mark with the Junction C.B.A. (See Fig. 2-a, 2-c)

B. FIXTURE Cable ② Connecting Method.

a) Connect the FIXTURE Cable ② between Main C.B.A and Pre-Amp Ass'y. (P3P01=P9301, P3P02=P9302)

b) At this time, should be in the left side " ◄ LEFT" mark on the P.C.B of the FIXTURE Cable ②. (See Fig 2-a, 2-b)

c) Connect the connector of "MAIN" mark of FIXTURE Cable ② with the Main C.B.A and the connector of "JUNCTION" mark with the Pre-Amp Ass'y. (See Fig. 2-a, 2-b)

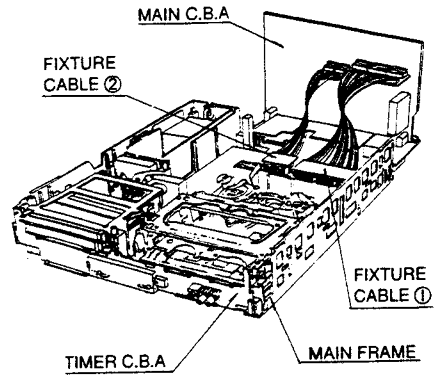

MAIN C.B.A
FIXTURE CABLE ②
FIXTURE CABLE ①
TIMER C.B.A
MAIN FRAME

Fig. 2-a

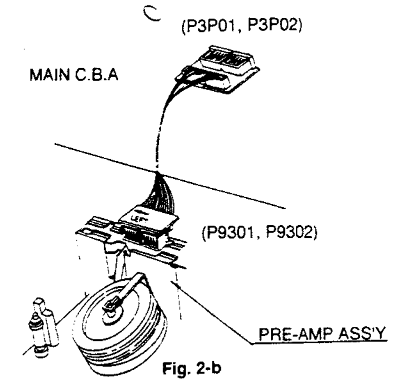

(P3P01, P3P02)
MAIN C.B.A
(P9301, P9302)
PRE-AMP ASS'Y

Fig. 2-b

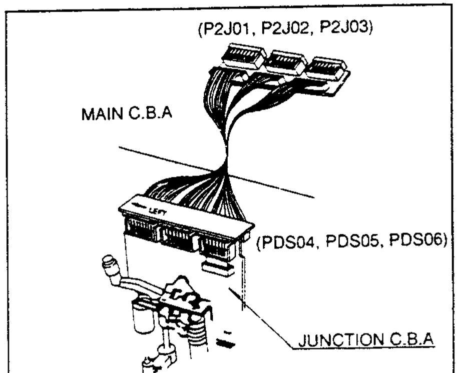
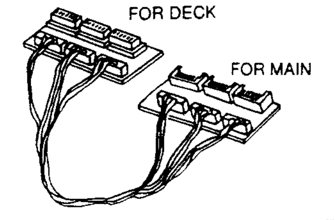

(P2J01, P2J02, P2J03)
MAIN C.B.A
(PDS04, PDS05, PDS06)
JUNCTION C.B.A

Fig. 2-c

2. Electrical Service Fixture List

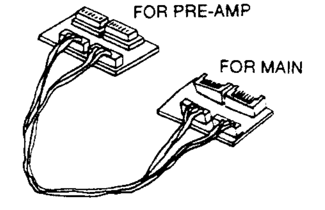
A. Fixture Cable ①.

Parts No.: 232-972A (Optional Parts)


FOR DECK
FOR MAIN

B. Fixture Cable ②.

Parts No.: 515-789A (Optional Parts)


FOR PRE-AMP
FOR MAIN

CABINET DISASSEMBLY

1. Top Case

A. Release 7 screws (1).

B. Hold the back of Top Case and lift it up slightly backward to remove it.

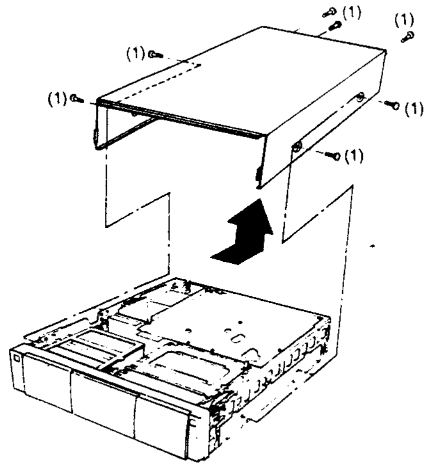


Fig. 2-1

2. Bottom Cover

A. Release 9 screws (2) to remove the Bottom Cover.

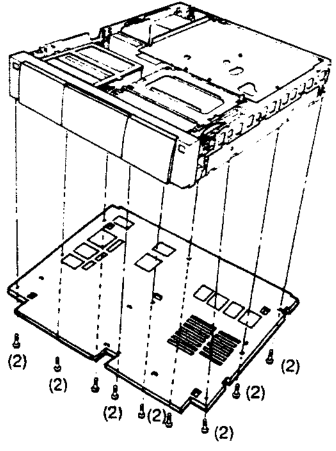


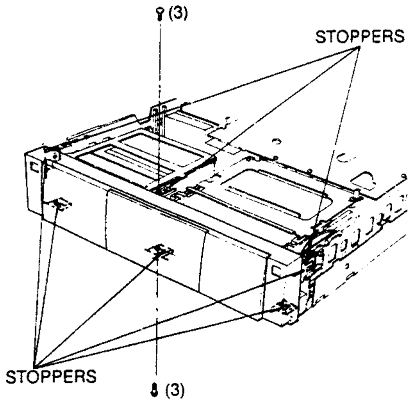
Fig. 2-2

3. Front Panel

A. Release 2 screws (3).

B. Remove the stoppers on the top of Front Panel.

C. Remove the stoppers on the bottom side Front Panel.



(3)
STOPPERS
STOPPERS
(3)

Fig. 2-3

* Caution

When reassemble the Front panel, assemble it in condition of inserting the Door Cassette inside, as shown in Fig.2-4

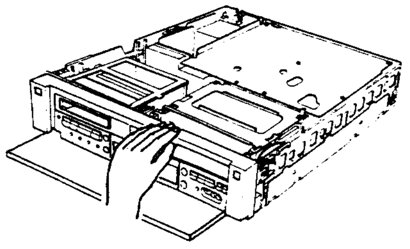
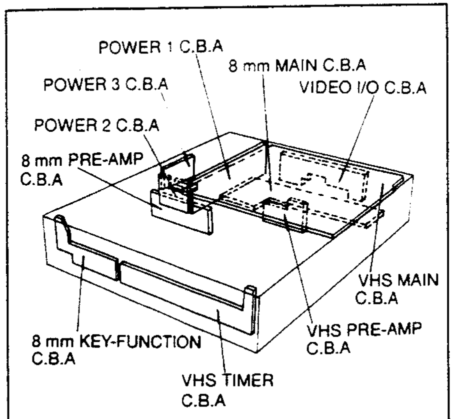


Fig. 2-4

CIRCUIT BOARD DISASSEMBLY

1.Circuit Board Arrangement



POWER 1 C.B.A
8 mm MAIN C.B.A
POWER 3 C.B.A
VIDEO I/O C.B.A
POWER 2 C.B.A
8 mm PRE-AMP C.B.A
VHS MAIN C.B.A
VHS PRE-AMP C.B.A
8 mm KEY-FUNCTION C.B.A
VHS TIMER C.B.A

Fig. 2-5

2. VHS Main Circuit Board

A. Release 4 screws (4).

B. Remove the Main C.B.A in the direction of arrow (A).

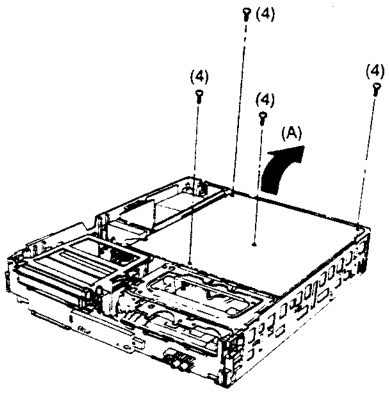


Fig. 2-6

3. Power 1, 2, 3 Circuit Board

A. Remove the Bottom Cover. (Fig. 2-2)

B. Release 4 screws (5).

C. Remove the Power C.B.A in the direction of arrow (B).

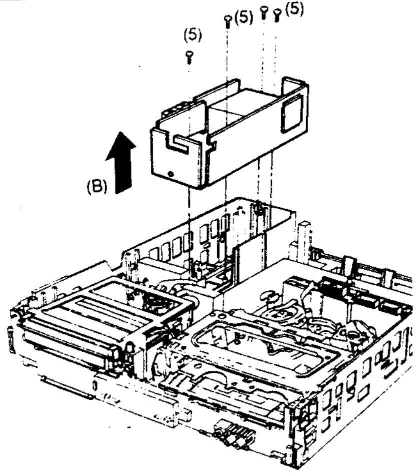


Fig. 2-7

4. 8mm Main Circuit Board

A. Release 2 screws (6).

B. Remove the 8mm Main C.B.A in the direction arrow (C).

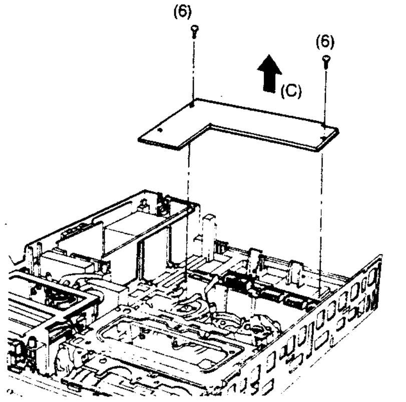


Fig. 2-8

5. 8mm/VHS Pre-Amp Circuit Board

A. Release 2 screws (7).
B. Remove the 8mm Pre-Amp C.B.A.
C. Release 3 screws (8).
D. Remove the VHS Pre-Amp C.B.A.

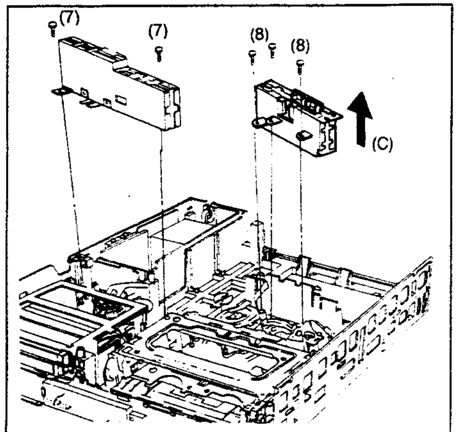


Fig. 2-9

6. 8 mm/VHS Key Function Circuit Board

A. Release screw (9).
B. Release 5 stoppers in the direction arrow (D).
C. Remove the 8mm/VHS Key Function C.B.A in the direction arrow (E).

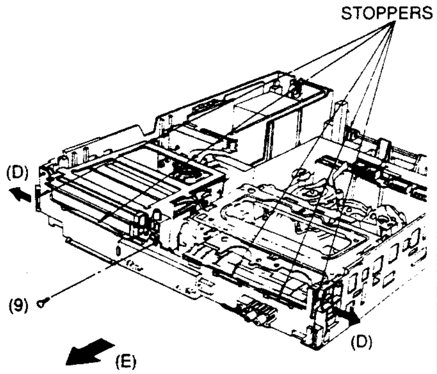
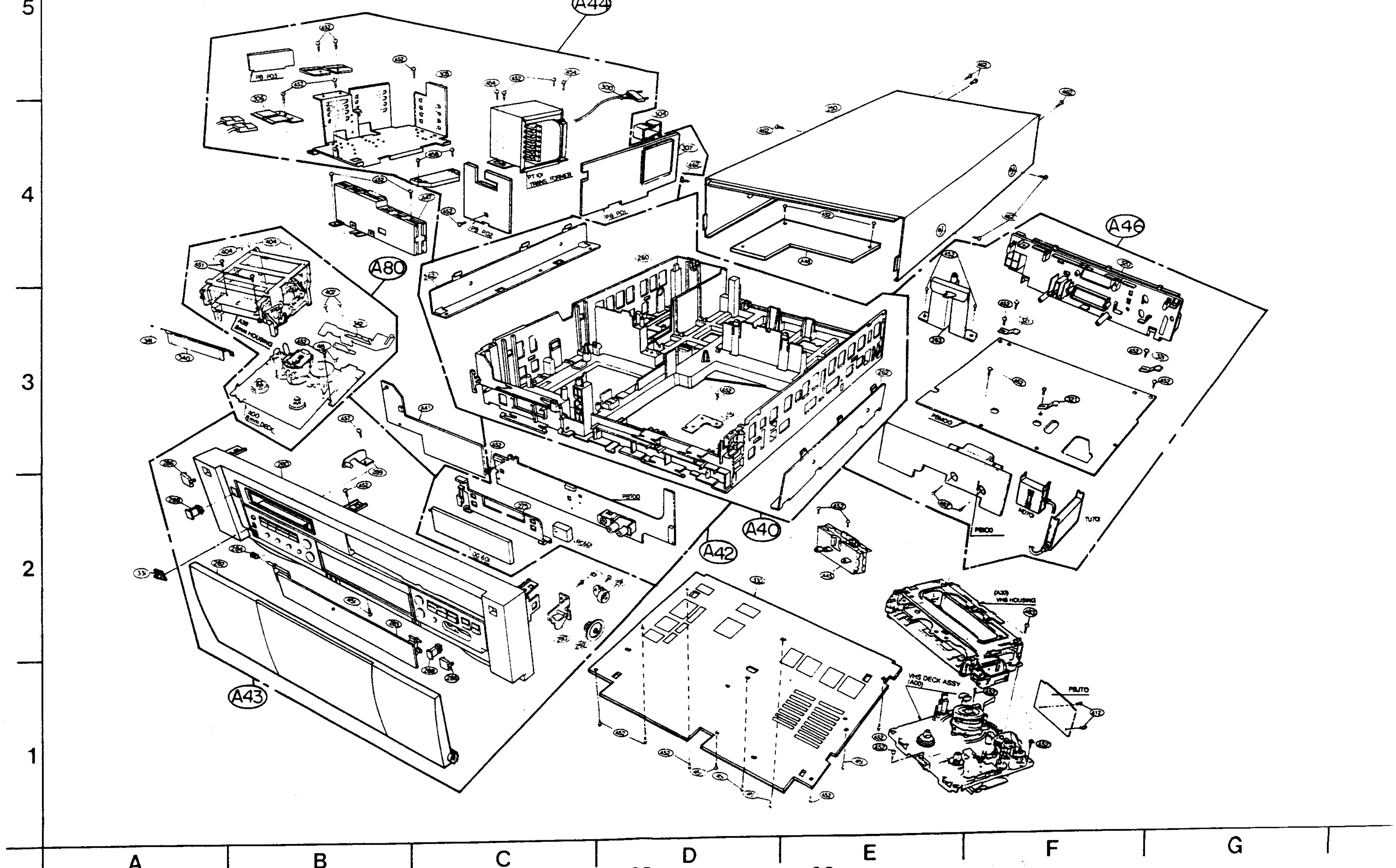


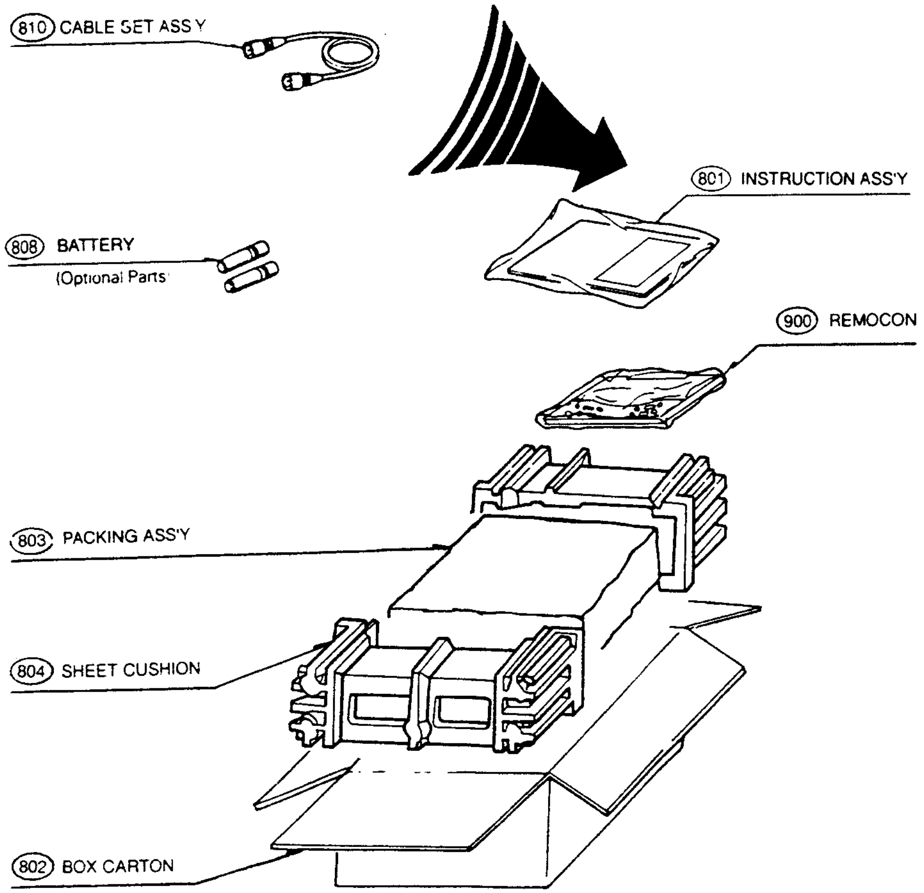
Fig. 2-10

EXPLODED VIEWS

1. Cabinet & Main Frame Section

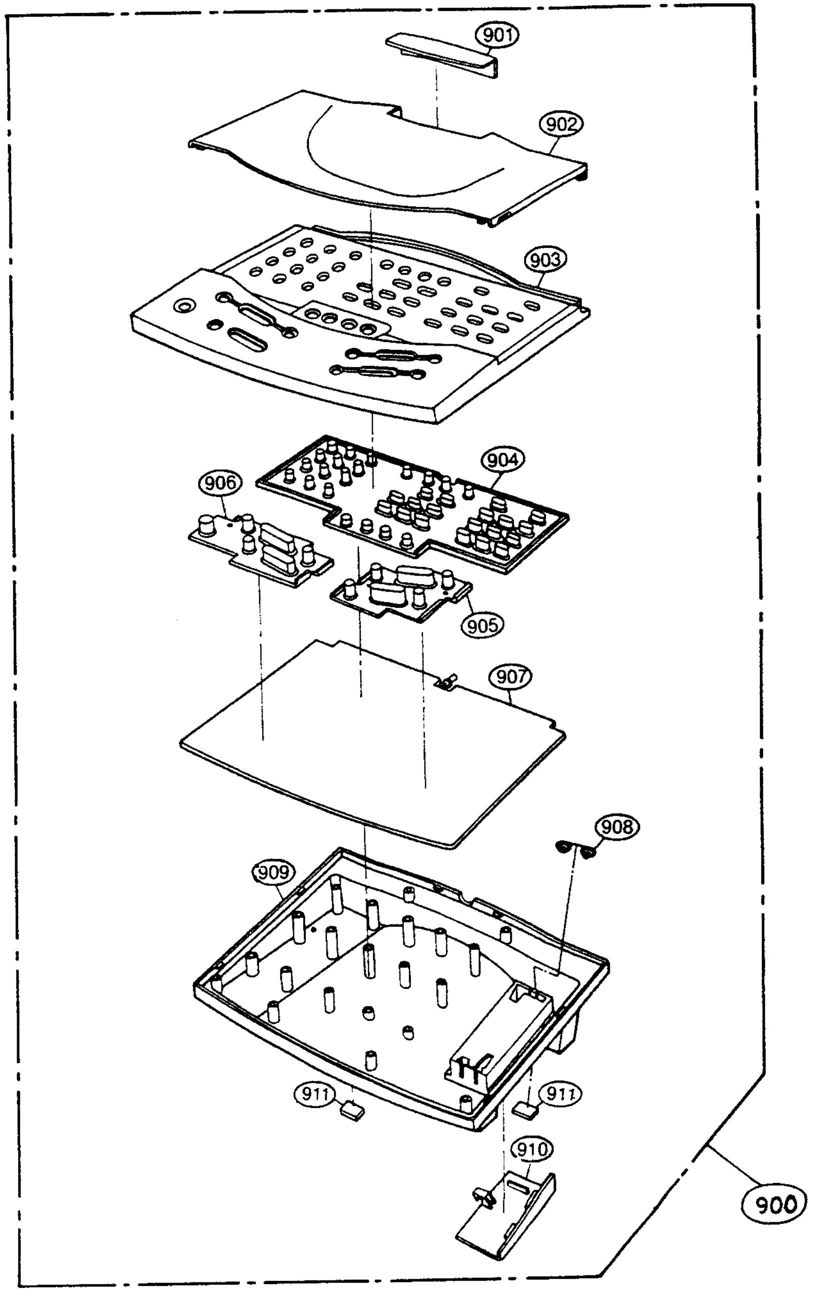

5
4
3
2
1
A
B
C
D
E
F
G
A44
452
PB P03
305
306
454
300
304
307
462
468
PT 101
TRANS FORMER
PB P02
PB P01
A47
A80
404
451
407
342
A30
8mm HOUSING
341
340
A00
8mm DECK
457
A41
260
262
250
A48
A46
320
321
263
PBM00
PB100
MD701
TU701
A40
A42
A45
286
280
289
288
284
282
331
283
290
292
291
272
PBT00
PC601
DG 601
A43
333
(A30)
VHS HOUSING
VHS DECK ASSY
(A00)
PBJT0
412

2. Packing Accessory Section



810 CABLE SET ASS'Y
801 INSTRUCTION ASS'Y
808 BATTERY
(Optional Parts)
900 REMOCON
803 PACKING ASS'Y
804 SHEET CUSHION
802 BOX CARTON

3. Remote Control Section



901
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904
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900

SECTION 3 ELECTRICAL

ELECTRICAL ADJUSTMENT PROCEDURES

• Electronic Test Equipment Requirement

- Oscilloscope
- Video signal Generator
- Modem Tester
- Level Meter
- Frequency Counter
- Power Supply
- Monitor Scope
- + Driver
- Test Tape (SP)-PAL, SECAM (VHS, 8mm)
- Recording Tape (VHS)
- Digital Multimeter

1. VHS Circuit Adjustment

1-1. Servo Circuit

1-1-1. PG Adjustment

MODE	SPECIFICATION	MEASUREMENT POINT	ADJUSTMENT POINT
PLAYBACK	6.5H±0.5H (1H=64.0μsec)	TP201 (H.SW) TP202 (V.Out terminal)	VR201

Procedure :

a. Playback a VHS PAL SP test tape.
b. Connect CH-1 of oscilloscope to TP201 (H.SW) and CH-2 to TP202 (Video Out terminal).
c. Trigger the complex Video signal to CH-1 H.SW, and adjust VR201 so that the distance from switching point of H.SW signal to the starting point of horizontal synchronized signal is 6.5H±0.5H (416±32μsec)

Waveform

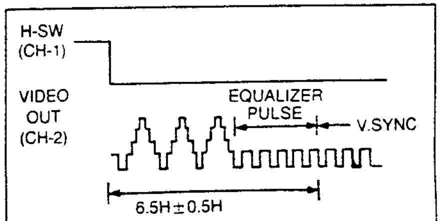


Fig. 3-1-1

1-2. Y/C Circuit

1-2-1. EE Level Adjustment

MODE	SPECIFICATION	MEASUREMENT POINT	ADJUSTMENT POINT
STOP	2.0±0.1Vp-p	TP202	VR304

Procedure :

a. Connect the Video signal Generator to Video in terminal.
b. Input Color Bar signal to Video in terminal.
c. Connect CH-1 of oscilloscope to TP202.
d. Adjust VR304 so that the value from the lower part of synchronism to 100% white signal is 2.0±0.1Vp-p.

Waveform

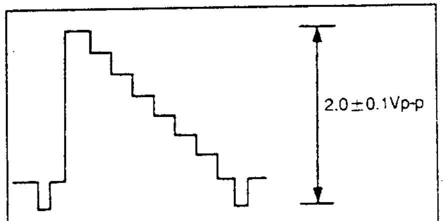


Fig. 3-1-2

1-2-2. Playback Luminance Level Adjustment

MODE	SPECIFICATION	MEASUREMENT POINT	ADJUSTMENT POINT
PLAYBACK (SP)	2.0±0.1Vp-p	TP202	VR305

Procedure :

a. Connect CH-1 of oscilloscope to TP202.
b. Playback a VHS PAL SP test tape (with 100% white signal).
c. Adjust VR305 so that the value from the lower part of synchronism to 100% white signal is 2.0 ±0.1Vp-p.

Waveform

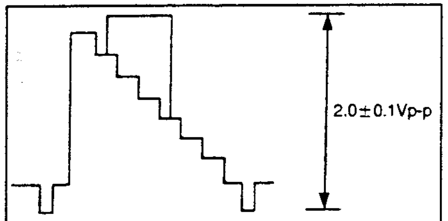


Fig. 3-1-3

1-2-3. FM Carrier Frequency Adjustment

MODE	SPECIFICATION	MEASUREMENT POINT	ADJUSTMENT POINT
RECORD LINE mode	3.8MHz±0.05MHz at SYNC Tip	TP301 (CAR/DEV TP)	VR303

Procedure :

a. Input Color Bar signal (with 100% white signal) to Video in terminal (Scart Jack).
b. Connect In terminal of Modem Tester to TP301.
c. Connect Out terminal of Modem Tester to CH-1 of oscilloscope (But the set and the Modem Tester should be connected with 10:1 probe).
d. The terminal position of Modem Tester is operated to be ATT.0dB, PAL/SECAM mode, Demod, Marker on.
e. Adjust VR303 so that SYNC Tip of video signal is agreed with 3.8MHz Marker on scope.

Waveform

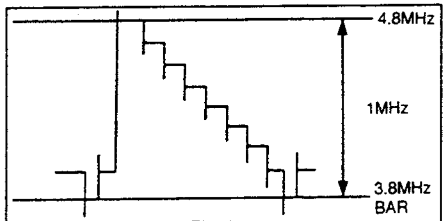


Fig. 3-1-4

1-2-4. FM Deviation Frequency Adjustment

MODE	SPECIFICATION	MEASUREMENT POINT	ADJUSTMENT POINT
RECORD LINE mode	4.8MHz±0.05MHz at White Peak	TP301 (CAR/DEV TP)	VR301

Procedure :

a. Input Color Bar signal (with 100% white signal) to Video in terminal (Scart Jack).
b. Connect In terminal of Modem Tester to TP301.
c. Connect Out terminal of Modem Tester to CH-1 of oscilloscope (But the set and the Modem Tester should be connected with 10:1 probe).
d. The terminal position of Modem Tester is operated to be ATT.0dB, PAL/SECAM mode, Demod, Marker on.
e. Adjust VR301 so that 100% white peak of Video signal is agreed with 4.8MHz Marker on scope.

Waveform

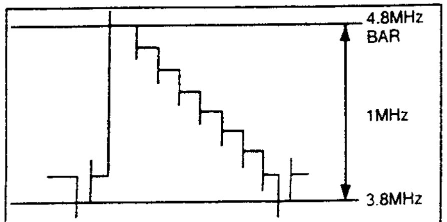


Fig. 3-1-5

1-2-5. Recording Luminance Level Adjustment

MODE	SPECIFICATION	MEASUREMENT POINT	ADJUSTMENT POINT
RECORD LINE mode	350mVp-p	TP302 (REC-Y)	VR302

Procedure :

a. Input Color Bar signal (with 100% white signal) to Video in terminal (Scart Jack).
b. Connect CH-1 of oscilloscope to TP202.
c. Connect CH-2 of oscilloscope to TP302.
d. Record the SP mode.
e. Adjust VR302 so that the waveform is 350mVp-p.

Waveform

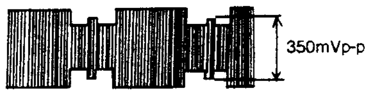


Fig. 3-1-6

1-2-6. SECAM Playback Gate Timing Adjustment

MODE	SPECIFICATION	MEASUREMENT POINT	ADJUSTMENT POINT
PLAYBACK	CH-1 & CH-2 Refer to waveform	TP202 TP303	VR306

Procedure :

a. Connect CH-1 of oscilloscope to TP202.
b. Connect CH-2 of oscilloscope to TP303.
c. Playback a VHS SECAM test tape (with 100% white color bar signal).
d. Adjust VR306 so that SYNC Gate signal of CH-2 is agreed with starting point of video signal sync period on scope CH-1.

Waveform

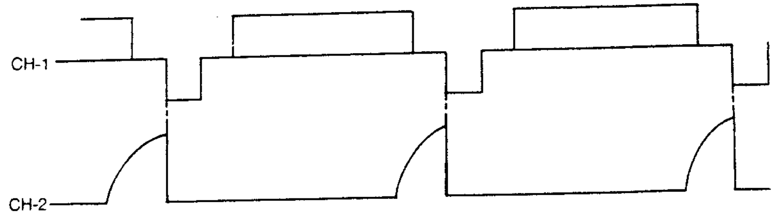


Fig. 3-1-7

1-2-7. SECAM Playback Input Bell Adjustment

MODE	SPECIFICATION	MEASUREMENT POINT	ADJUSTMENT POINT
PLAYBACK	Refer to waveform	TP202 TP304	FL306

Procedure :

a. Connect CH-1 of oscilloscope to TP202.
b. Connect CH-2 of oscilloscope to TP302.
c. Playback a VHS SECAM test tape (with 100% white color bar signal).
d. Adjust FL306 so that the envelope waveform of color signal become a flat level it not flat.

Waveform

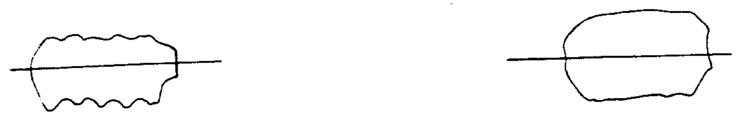

Before Adjustment
After Adjustment

Fig. 3-1-8

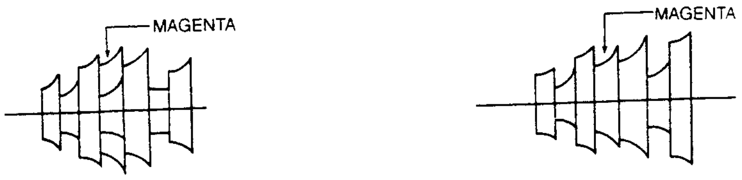
1-2-8. SECAM Playback Output Bell Adjustment

MODE	SPECIFICATION	MEASUREMENT POINT	ADJUSTMENT POINT
PLAYBACK	Refer to waveform	TP202 TP305	FL308

Procedure :

a. Connect CH-1 of oscilloscope to TP202.
b. Connect CH-2 of oscilloscope to TP305.
c. Playback a VHS SECAM test tape (with 100% white color bar signal).
d. Adjust FL308 so that the Magenta part of color signal become a flat level if not flat.

Waveform



Before Adjustment
After Adjustment

Fig. 3-1-9

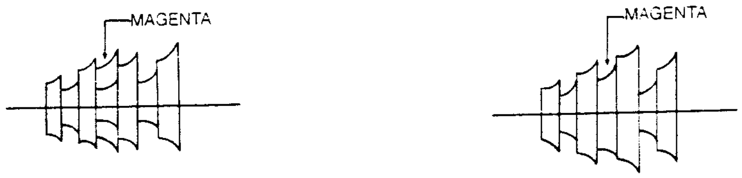
1-2-9. SECAM Recording Bell Adjustment

MODE	SPECIFICATION	MEASUREMENT POINT	ADJUSTMENT POINT
RECORD	Refer to waveform	TP202 TP304	FL305

Procedure :

a. Connect CH-1 of oscilloscope to TP202.
b. Connect CH-2 of oscilloscope to TP304.
c. Input SECAM Color bar signal (with 100% white signal) to Video in terminal (Scart Jack).
d. Record the SP mode.
e. Adjust FL305 so that the Magenta part of color signal become a flat level if not flat.

Waveform



Before Adjustment
After Adjustment

Fig. 3-1-10

1-3. Audio Circuit

1-3-1. Record Bias Adjustment

MODE	SPECIFICATION	MEASUREMENT POINT	ADJUSTMENT POINT
RECORD (SP)	2.6±0.05mVrms	R436 Both Terminal	VR401

Procedure :

a. Loading the recording tape and record.
b. Connect (+), (−) terminal of Level Meter to both terminals R436.
c. Adjust VR401 so that the oscillation voltage fit to specification.

1-4. Tuner/IF Circuit

1-4-1. VIF Adjustment

MODE	SPECIFICATION	MEASUREMENT POINT	ADJUSTMENT POINT
EE	2.5V±0.1V	TP702	T701

Procedure :

a. Connect as shown in Fig. 3-1-11.
b. Receive the CH-11 (217.25MHz).
c. Adjust T701 so that the Digital voltmeter 1 is 2.5 ±0.1V.

CONNECTION DIAGRAM

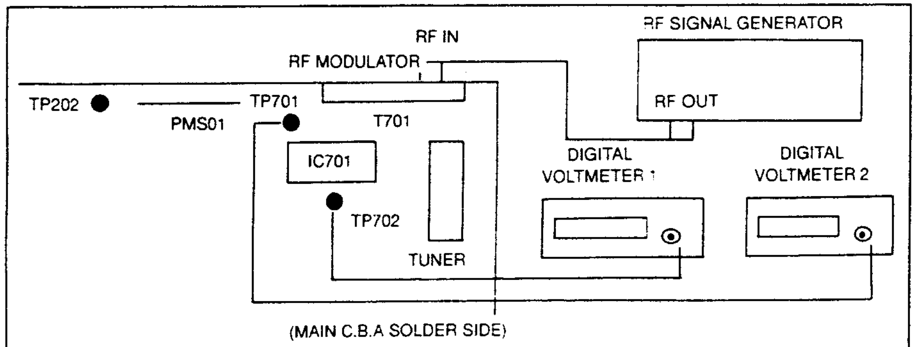


Fig. 3-1-11

***Caution in testing**

1. When practing this adjustment, adjust after more than 10minutes with TV set turning on.
2. Adjust after completing itself test of measuring apparatus.
3. Sweep OSC marker frequency is followed by Table 1.

***Abbreviation**

- APC : Adjacent Picture Carrier
- SIF : Sound Intermediate Frequency
- CIF : Color Intermediate Frequency
- CEN : Center Frequency
- PIF : Picture Intermediate Frequency
- ASC : Adjacent Sound Carrier

Table 1 Frequency Table (MHz)

BROADCASTING SYSTEM	ADJUSTMENT MARKER FREQUENCY					
	APC	SIF	CIF	CEN	PIF	ASC
PAL B/G+SECAM L	31.90	33.40	34.47	36.00	38.90	40.40

1-4-2. RF AGC Adjustment

MODE	SPECIFICATION	MEASUREMENT POINT	ADJUSTMENT POINT
EE	$4.7^{+0.1}_{-0}$V	TP701	VR701

Procedure :

a. Connect as shown in Fig. 3-1-11.
b. Receive the CH-11 (217.25MHz, strength of input electric field : 70dBμV).
c. Adjust VR701 so that the Digital voltmeter 2 is $4.7^{+0.1}_{-0}$V.

2. 8mm Circuit Adjustment

2-1. Servo Circuit

2-1-1. PG Adjustment

MODE	SPECIFICATION	MEASUREMENT POINT	ADJUSTMENT POINT
PLAYBACK	7H±1.8H (1H=64.0μsec)	TP4K1 (H.SW) TP3A1 (V.Out terminal)	VR501

Procedure :

a. Playback a 8mm PAL SP test tape.
b. Connect CH-1 of oscilloscope to TP4K1 (H.SW) and CH-2 to TP3A1 (Video Out terminal)
c. Trigger the complex Video signal to CH-1 H.SW, and adjust VR501 so that the distance from switching point of H.SW signal to the starting point of horizontal synchronized signal is 7H± 1.8H (448±115.2μsec).

Waveform

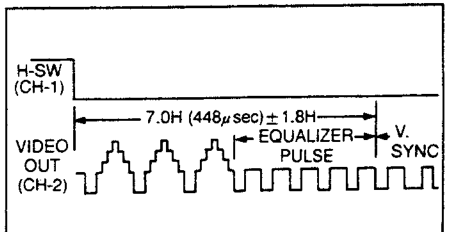


Fig. 3-2-1

2-2. Y/C Circuit

2-2-1. Playback Output Level Adjustment

MODE	SPECIFICATION	MEASUREMENT POINT	ADJUSTMENT POINT
PLAYBACK (SP)	1.0±0.05Vp-p	TP3A1	VR3A1

Procedure :

a. Connect CH-1 of oscilloscope to TP3A1.
b. Playback a 8mm PAL SP test tape (Color bar with 100% white signal).
c. Adjust VR3A1 so that Video out level is 1.0± 0.05Vp-p.

Waveform

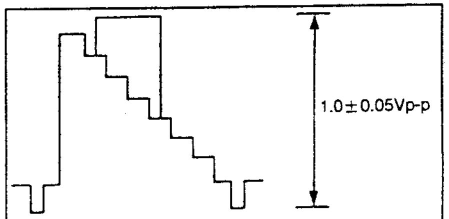


Fig. 3-2-2

2-2-2. Color VCO Adjustment

MODE	SPECIFICATION	MEASUREMENT POINT	ADJUSTMENT POINT
PLAYBACK (SP)	DC2.5±0.1Vp-p	TP3A2	FL3A2

Procedure :

a. Connect CH-1 of oscilloscope to TP3A2.
b. Playback a 8mm PAL SP test tape (Color bar with 100% white signal).
c. Adjust FL3A2 so that DC level is 2.5±0.1Vp-p.

2-3. Audio Circuit

2-3-1. FM VCO Adjustment

MODE	SPECIFICATION	MEASUREMENT POINT	ADJUSTMENT POINT
PLAYBACK (SP)	DC2.1±0.1Vp-p	TP4A2	VR4A2

Procedure :

a. Connect CH-1 of oscilloscope to TP4A2.
b. Playback a 8mm PAL SP test tape (with 400Hz Audio signal).
c. Adjust VR4A2 so that Center Voltage is DC2.1±0.1Vp-p.

Waveform

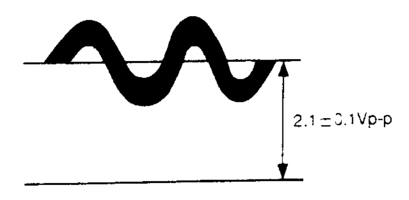


Fig. 3-2-3

2-3-2. FM Deviation Adjustment

MODE	SPECIFICATION	MEASUREMENT POINT	ADJUSTMENT POINT
PLAYBACK (SP)	6±0.5dBm	TP4A1 (Audio Out terminal)	VR4A1

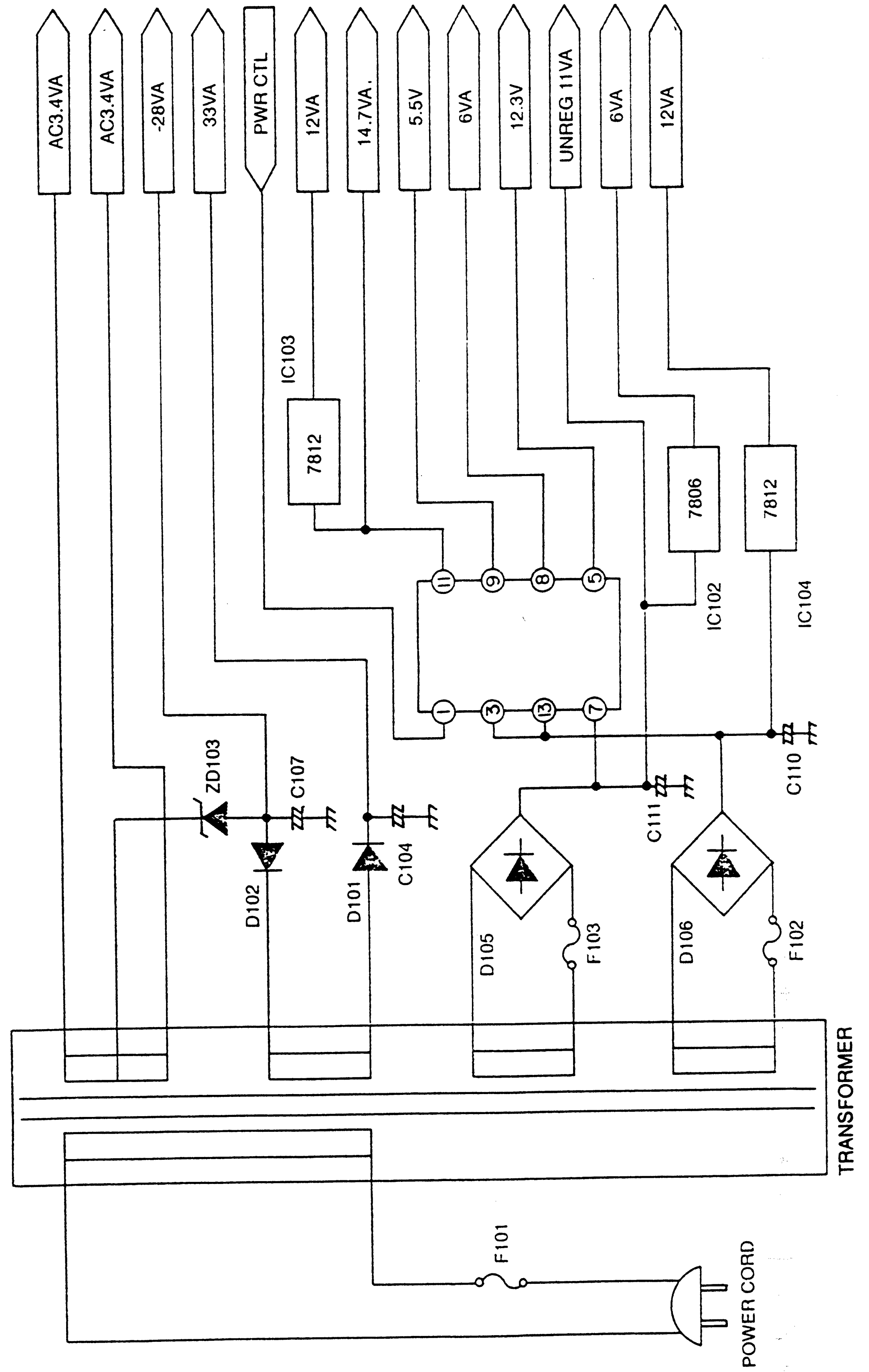
Procedure :

a. Connect (+) terminal of Level Meter to TP4A1 (Audio Out terminal).
b. Playback a 8mm PAL SP test tape (with 1KHz or 400Hz Audio signal).
c. Adjust VR4A1 so that level is 6±0.5dBm.

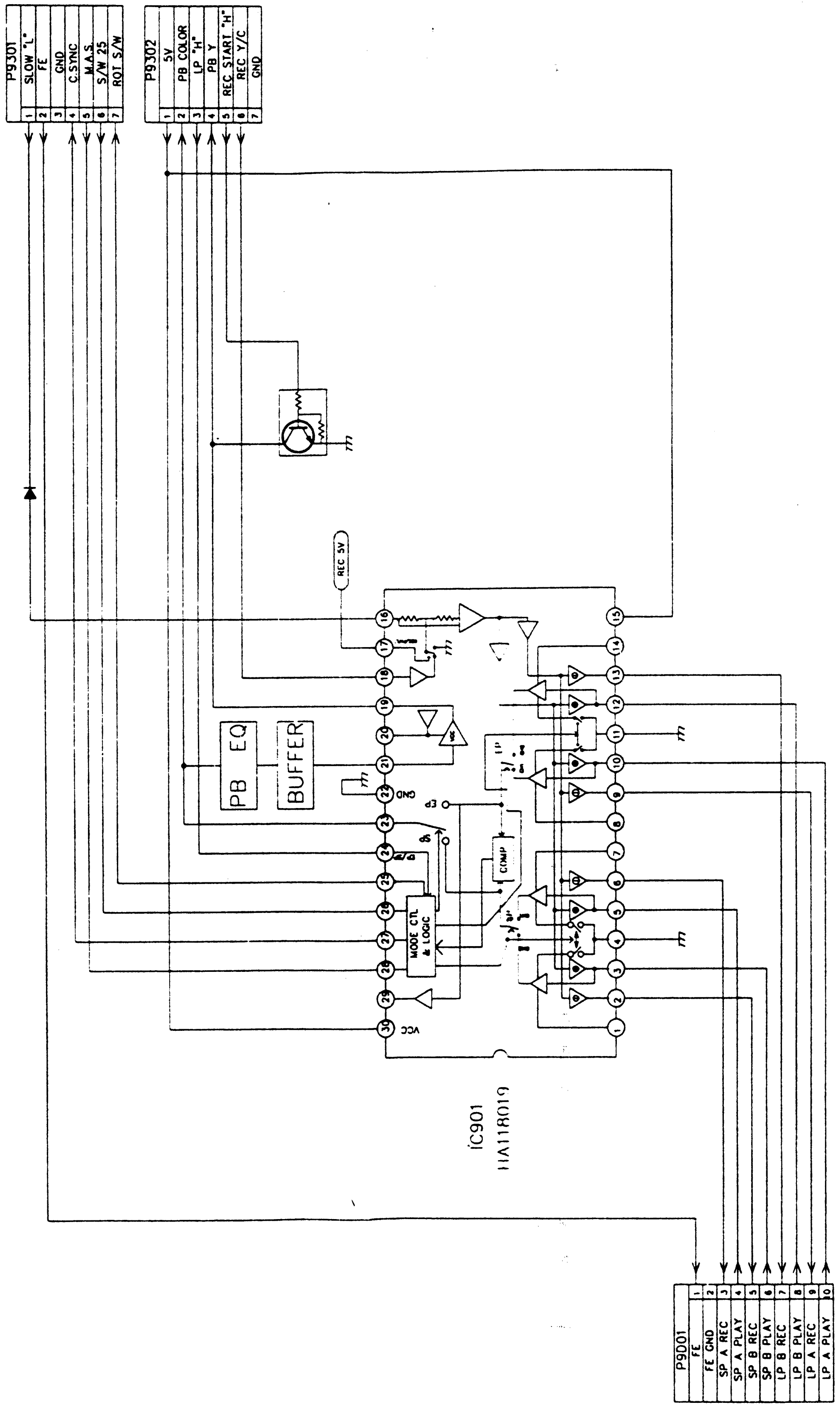
BLOCK DIAGRAMS

1. VHS Block Diagrams

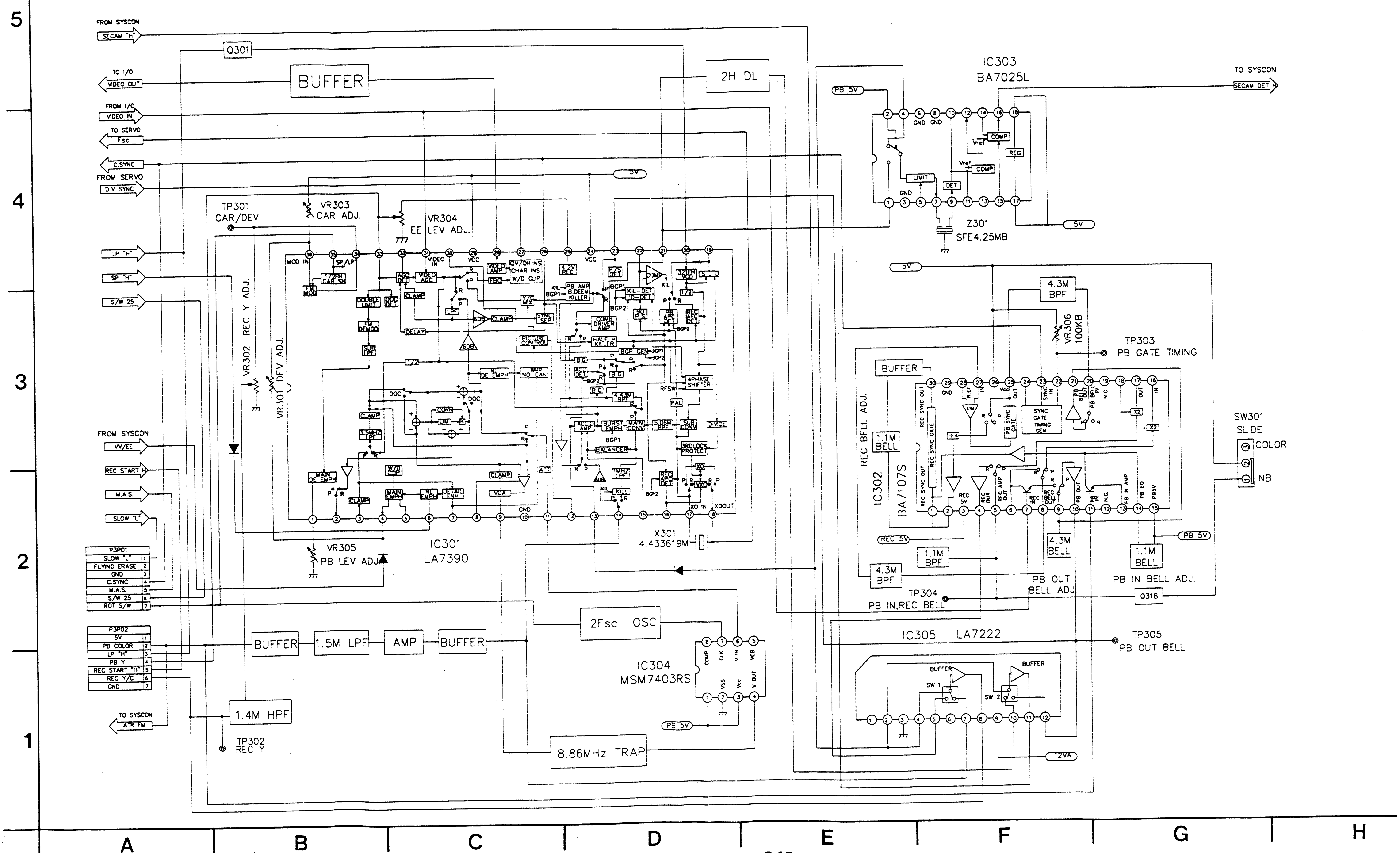
1-1. Power Block Diagram


AC3.4VA
AC3.4VA
-28VA
33VA
PWR CTL
12VA
14.7VA.
5.5V
6VA
12.3V
UNREG 11VA
6VA
12VA
IC103
7812
7806
7812
IC102
IC104
11
9
8
5
1
3
13
7
ZD103
C107
D102
D101
C104
C111
C110
D105
F103
D106
F102
TRANSFORMER
F101
POWER CORD

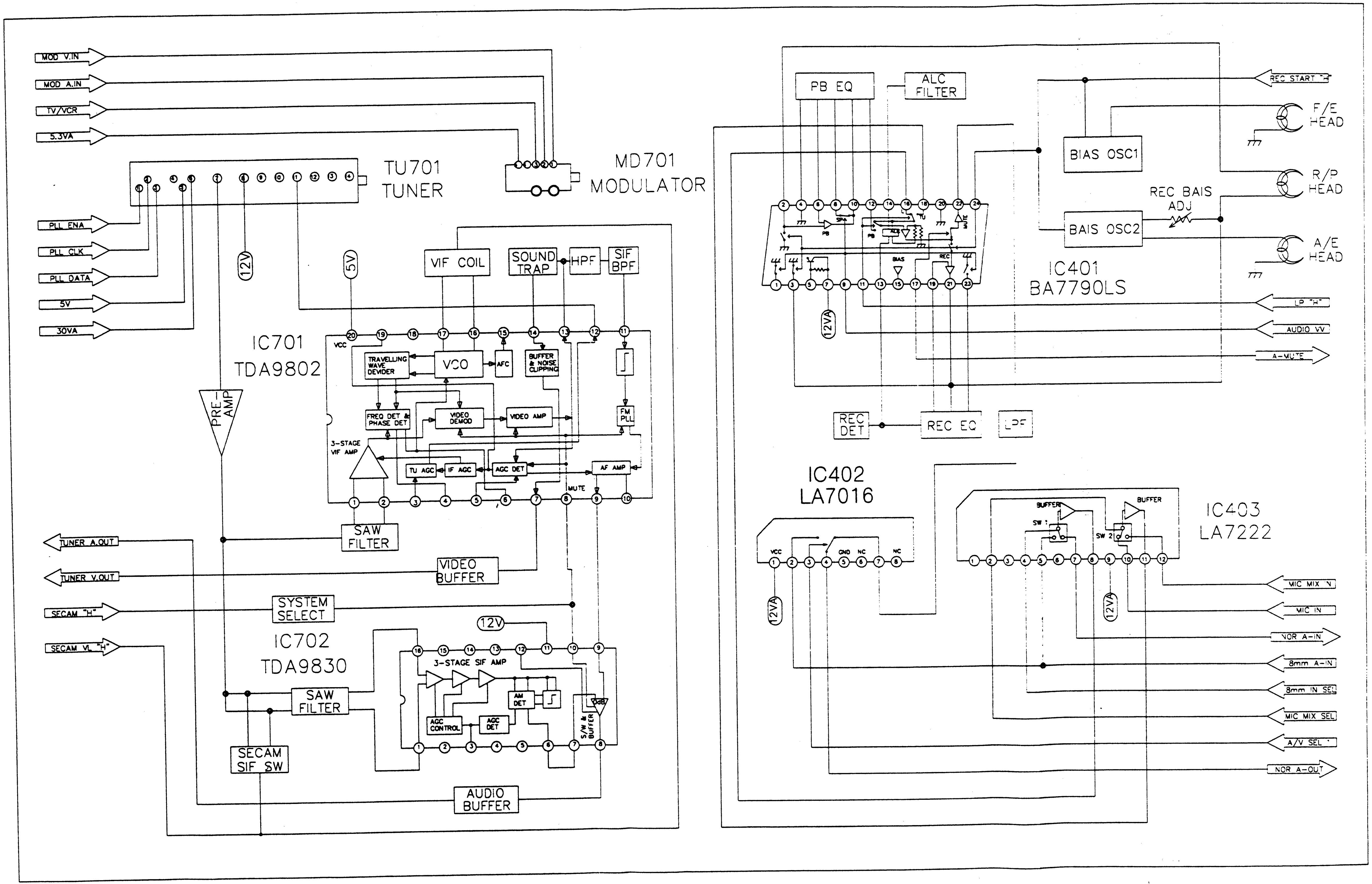
1-2. Pre-Amp Block Diagram


P9301
1 SLOW "L"
2 FE
3 GND
4 C.SYNC
5 M.A.S.
6 S/W 25
7 ROT S/W
P9302
1 5V
2 PB COLOR
3 LP "H"
4 PB Y
5 REC START "H"
6 REC Y/C
7 GND
REC 5V
PB EQ
BUFFER
GND
EP
SP
COMP
MODE CTL & LOGIC
VCC
IC901
HA118019
P9D01
1 FE
2 FE GND
3 SP A REC
4 SP A PLAY
5 SP B REC
6 SP B PLAY
7 LP B REC
8 LP B PLAY
9 LP A REC
10 LP A PLAY

1-3. Y/C Block Diagram


FROM SYSCON
SECAM "H"
Q301
TO I/O
VIDEO OUT
BUFFER
FROM I/O
VIDEO IN
TO SERVO
Fsc
C.SYNC
FROM SERVO
D.V SYNC
5V
2H DL
IC303
BA7025L
PB 5V
TO SYSCON
SECAM DET H
GND
LIMIT
DET
COMP
REG
Vref
Z301
SFE4.25MB
TP301
CAR/DEV
VR303
CAR ADJ.
VR304
EE LEV ADJ.
LP "H"
SP "H"
S/W 25
VR302 REC Y ADJ.
VR301 DEV ADJ.
MOD IN
SP/LP
VIDEO IN
VCC
FM MOD
1/2 FH CAR SH
DOUBLE LIMIT
DOC DET
FM DEMOD
SUB LPF
AGC DET
VIDEO AGC
CLAMP
LPF
6DB
DELAY
VIDEO AMP
FBC
0V/OH INS CHAR INS W/D CLIP
Y/C MIX
SYNC SEP
PICTURE CONTROL
4.2V REG
KIL
BCP1
PB AMP B.DEEM KILLER
COMB DRIVER AMP
HALF H KILLER
P/S DET
COMP
32FH VCO
1/2
KIL-DET ID-DET
90 P.S.
PB APC DET
REC APC DET
BGP GEN
BGP2
NL DE EMPH
W/D NO CAN
DOC
CORR
LIM
3.58MHZ LPF
MAIN DE EMPH
W/D CLIP
MAIN EMPH
NL EMPH
DETAIL ENH
VCA
ACC AMP
BURST EMPH
MAIN CONV
5.06M BPF
SUB CONV
DIVIDE
BALANCER
3RD LOCK PROTECT
4.43M BPF
B.G
PAL
4PHASE SHIFTER
RFSW
1MHZ LPF
KILL
REC APC DET
VXO
XO IN
XOOUT
GND
ATT
ACC
VR305
PB LEV ADJ
IC301
LA7390
X301
4.433619M
FROM SYSCON
VV/EE
REC START H
M.A.S.
SLOW "L"
P3P01
SLOW "L"
FLYING ERASE
GND
C.SYNC
M.A.S.
S/W 25
ROT S/W
P3P02
5V
PB COLOR
LP "H"
PB Y
REC START "H"
REC Y/C
GND
TO SYSCON
ATR FM
BUFFER
1.5M LPF
AMP
BUFFER
1.4M HPF
TP302
REC Y
2Fsc OSC
IC304
MSM7403RS
COMP
CLK
V IN
VCB
VSS
Vcc
V OUT
PB 5V
8.86MHz TRAP
4.3M BPF
VR306
100KB
TP303
PB GATE TIMING
BUFFER
REC BELL ADJ.
1.1M BELL
IC302
BA7107S
REC SYNC OUT
REC SYNC GATE
REF
LIM
PB SYNC GATE
SYNC GATE TIMING GEN
PB BELL IN
PB BELL OUT
N.C
OUT
IN
X2
÷4
REC 5V
REC OUT
REC AMP OUT
REC IN
REC BELL OUT
PB OUT
PB IN
PB IN AMP
PB EQ
PB5V
REC 5V
1.1M BPF
4.3M BPF
4.3M BELL
PB OUT BELL ADJ.
1.1M BELL
PB IN BELL ADJ.
PB 5V
TP304
PB IN,REC BELL
Q318
SW301
SLIDE
COLOR
NB
IC305 LA7222
TP305
PB OUT BELL
BUFFER
SW 1
SW 2
12VA
5
4
3
2
1
A
B
C
D
E
F
G
H

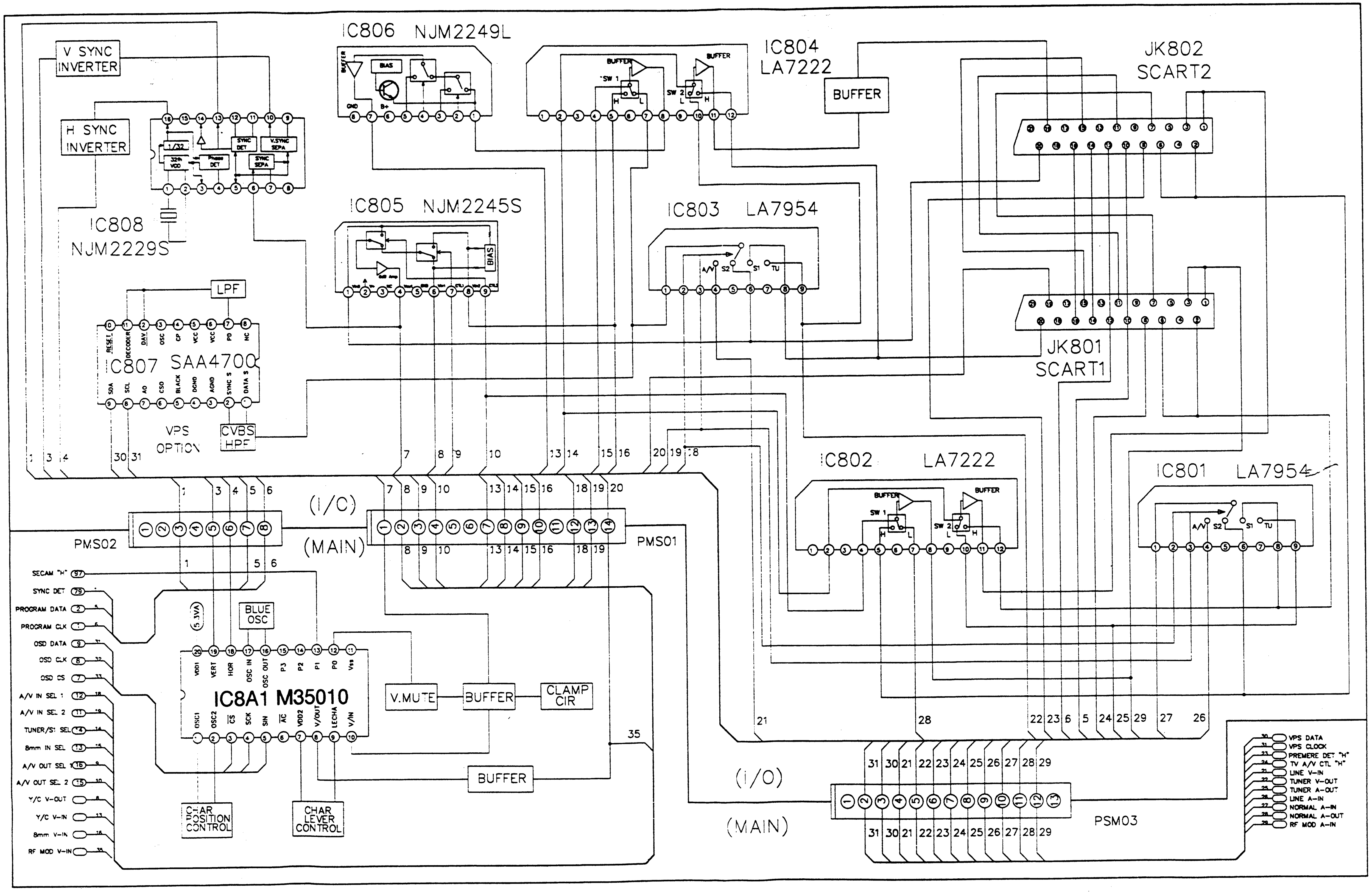
1-4. Tuner/IF & Audio Block Diagram


MOD V.IN
MOD A.IN
TV/VCR
5.3VA
TU701
TUNER
MD701
MODULATOR
PLL ENA
PLL CLK
PLL DATA
5V
30VA
12V
5V
VIF COIL
SOUND TRAP
HPF
SIF BPF
IC701
TDA9802
PRE-AMP
VCC
TRAVELLING WAVE DEVIDER
VCO
AFC
BUFFER & NOISE CLIPPING
FREQ DET & PHASE DET
VIDEO DEMOD
VIDEO AMP
FM PLL
3-STAGE VIF AMP
TU AGC
IF AGC
AGC DET
AF AMP
MUTE
SAW FILTER
TUNER A.OUT
TUNER V.OUT
VIDEO BUFFER
SECAM "H"
SYSTEM SELECT
SECAM VL "H"
12V
IC702
TDA9830
3-STAGE SIF AMP
AM DET
AGC CONTROL
AGC DET
S/W & BUFFER
0dB
SAW FILTER
SECAM SIF SW
AUDIO BUFFER
PB EQ
ALC FILTER
REC START "H"
F/E HEAD
BIAS OSC1
R/P HEAD
REC BAIS ADJ
BAIS OSC2
A/E HEAD
IC401
BA7790LS
PB
ALC
BIAS
REC
MUTE
12VA
LP "H"
AUDIO VV
A-MUTE
REC DET
REC EQ
LPF
IC402
LA7016
VCC
GND
NC
NC
12VA
IC403
LA7222
BUFFER
BUFFER
SW 1
SW 2
12VA
MIC MIX "H"
MIC IN
NOR A-IN
8mm A-IN
8mm IN SEL
MIC MIX SEL
A/V SEL "
NOR A-OUT

5
4
3
2
1

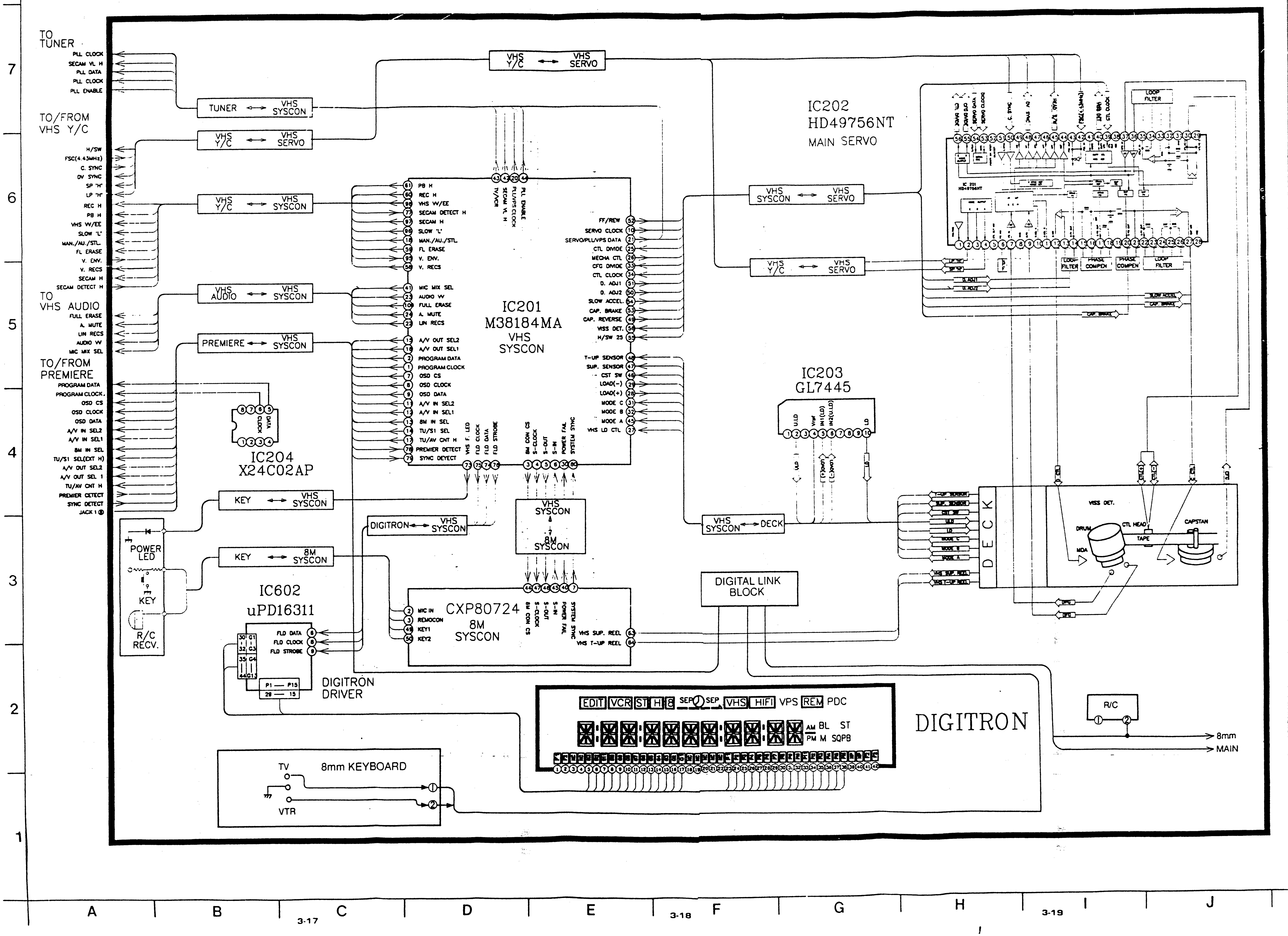
A B C D E F G

1-5. In/Out & Function OSD Block Diagram



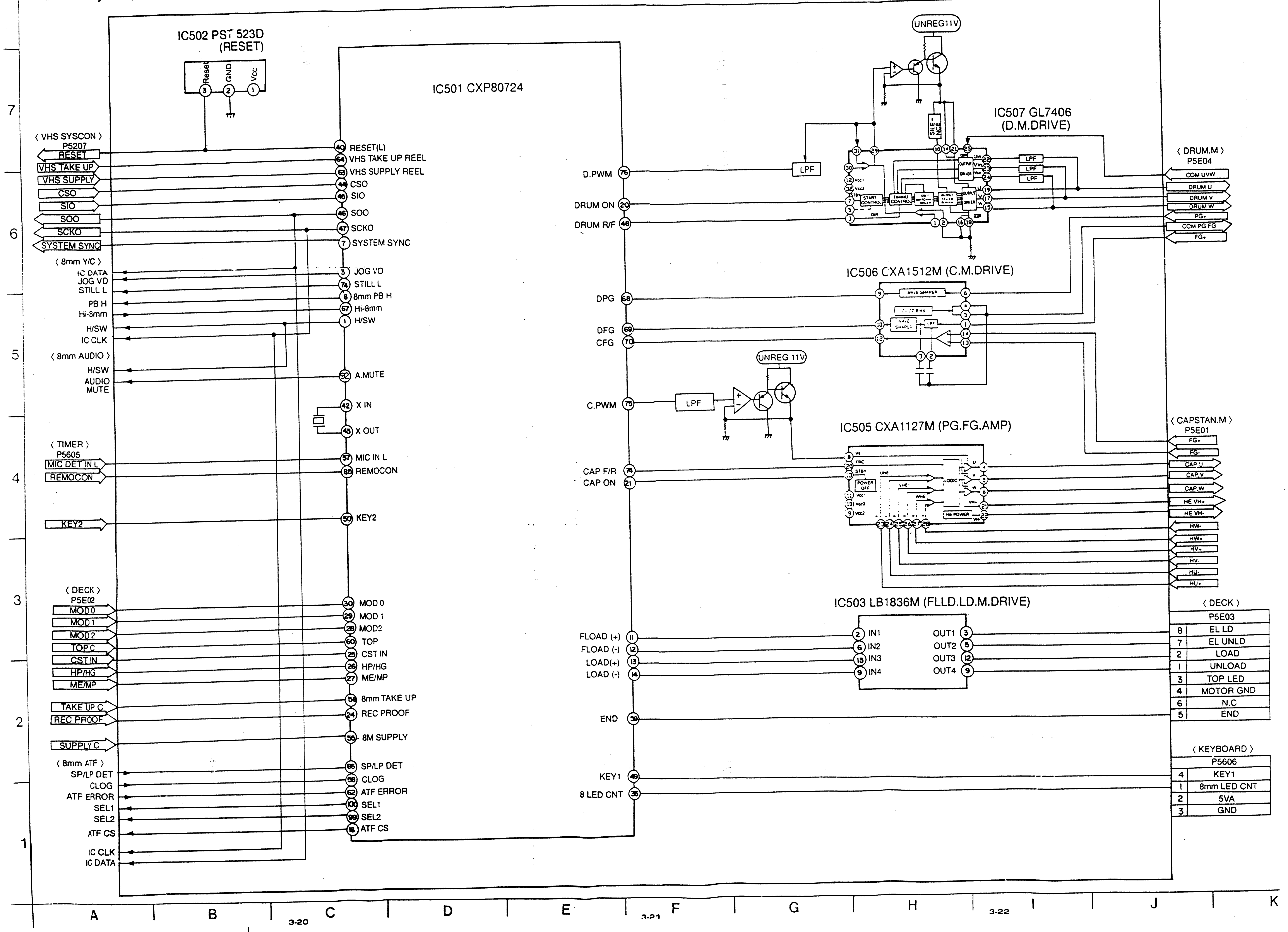
IC806 NJM2249L
BUFFER
BIAS
GND
B+
IC804
LA7222
BUFFER
SW 1
SW 2
H
L
BUFFER
JK802
SCART2
V SYNC INVERTER
H SYNC INVERTER
1/32
32fH VCO
Phase DET
SYNC DET
V.SYNC SEPA
SYNC SEPA
IC808
NJM2229S
IC805 NJM2245S
BIAS
IC803 LA7954
A/V
S2
S1
TU
LPF
RESET
DECODER
DAV
OSC
CP
VCC
VCC
PD
NC
IC807 SAA4700
SDA
SCL
AO
CSO
BLACK
DGND
AGND
SYNC S
DATA S
VPS OPTION
CVBS HPF
JK801
SCART1
IC802 LA7222
IC801 LA7954
(I/C)
(MAIN)
PMS02
PMS01
SECAM "H" 97
SYNC DET 79
PROGRAM DATA 2
PROGRAM CLK 1
OSD DATA 9
OSD CLK 8
OSD CS 7
A/V IN SEL 1 12
A/V IN SEL 2 11
TUNER/ST SEL 14
8mm IN SEL 13
A/V OUT SEL 1 16
A/V OUT SEL 2 15
Y/C V-OUT
Y/C V-IN
8mm V-IN
RF MOD V-IN
(5.1W)
BLUE OSC
VDD1
VERT
HOR
OSC IN
OSC OUT
P3
P2
P1
PO
Vss
IC8A1 M35010
OSC1
OSC2
CS
SCK
SIN
AC
VDD2
V/OUT
LECHA
V/IN
V.MUTE
BUFFER
CLAMP CIR
BUFFER
CHAR POSITION CONTROL
CHAR LEVER CONTROL
(I/O)
(MAIN)
PSM03
30 VPS DATA
31 VPS CLOCK
23 PREMERE DET "H"
24 TV A/V CTL "H"
21 LINE V-IN
22 TUNER V-OUT
25 TUNER A-OUT
26 LINE A-IN
27 NORMAL A-IN
28 NORMAL A-OUT
29 RF MOD A-IN
5
4
3
2
1
A
B
C
D
E
F
G
H

1-6. Main System (Servo, Syscon, Timer) Block Diagram

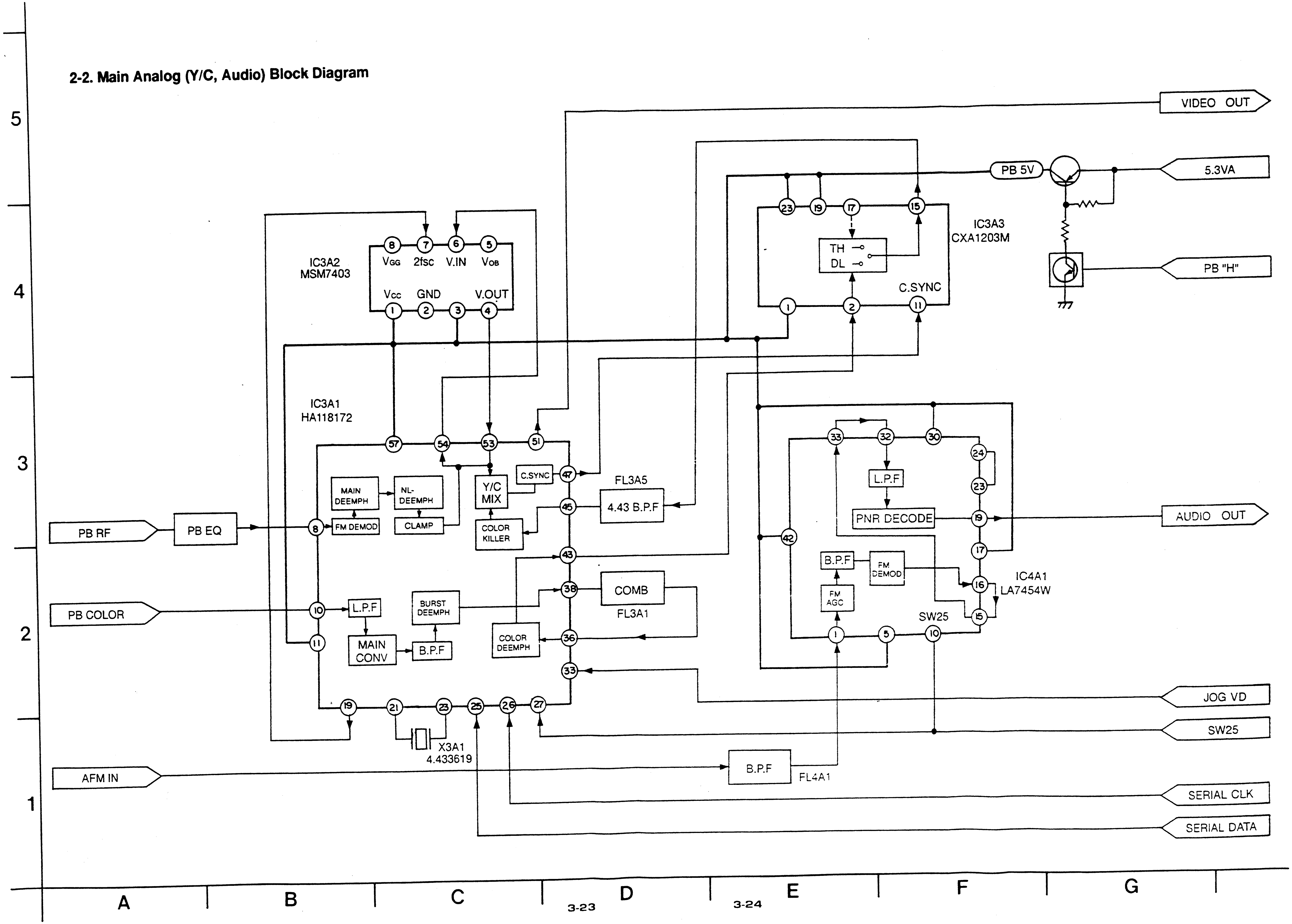

TO TUNER
PLL CLOCK
SECAM VL H
PLL DATA
PLL CLOCK
PLL ENABLE
TO/FROM VHS Y/C
H/SW
FSC(4.43MHz)
C. SYNC
DV SYNC
SP 'H'
LP 'H'
REC H
PB H
VHS W/EE
SLOW 'L'
MAN./AU./STL.
FL ERASE
V. ENV.
V. RECS
SECAM H
SECAM DETECT H
TO VHS AUDIO
FULL ERASE
A. MUTE
LIN RECS
AUDIO W
MIC MIX SEL
TO/FROM PREMIERE
PROGRAM DATA
PROGRAM CLOCK
OSD CS
OSD CLOCK
OSD DATA
A/V IN SEL2
A/V IN SEL1
8M IN SEL
TU/S1 SEL(EXT H)
A/V OUT SEL2
A/V OUT SEL 1
TU/AV CNT H
PREMIER CETECT
SYNC DETECT
JACK 1
TUNER ↔ VHS SYSCON
VHS Y/C ↔ VHS SERVO
VHS Y/C ↔ VHS SYSCON
VHS AUDIO ↔ VHS SYSCON
PREMIERE ↔ VHS SYSCON
IC204
X24C02AP
CLOCK
DATA
KEY ↔ VHS SYSCON
KEY ↔ 8M SYSCON
POWER LED
KEY
R/C RECV.
IC602
uPD16311
FLD DATA
FLD CLOCK
FLD STROBE
DIGITRON DRIVER
P1 — P15
29 — 15
DIGITRON ↔ VHS SYSCON
8mm KEYBOARD
TV
VTR
IC201
M38184MA
VHS SYSCON
PB H
REC H
VHS W/EE
SECAM DETECT H
SECAM H
SLOW 'L'
MAN./AU./STL.
FL ERASE
V. ENV.
V. RECS
MIC MIX SEL
AUDIO W
FULL ERASE
A. MUTE
LIN RECS
A/V OUT SEL2
A/V OUT SEL1
PROGRAM DATA
PROGRAM CLOCK
OSD CS
OSD CLOCK
OSD DATA
A/V IN SEL2
A/V IN SEL1
8M IN SEL
TU/S1 SEL
TU/AV CNT H
PREMIER DETECT
SYNC DETECT
TV/VCR
SECAM VL H
PLL/VPS CLOCK
PLL ENABLE
FF/REW
SERVO CLOCK
SERVO/PLL/VPS DATA
CTL DIVIDE
MECHA CTL
CFG DIVIDE
CTL CLOCK
D. ADJ1
D. ADJ2
SLOW ACCEL.
CAP. BRAKE
CAP. REVERSE
VISS DET.
H/SW 25
T-UP SENSOR
SUP. SENSOR
CST SW
LOAD(-)
LOAD(+)
MODE C
MODE B
MODE A
VHS LD CTL
VHS F. LED
FLD CLOCK
FLD DATA
FLD STROBE
8M CON CS
S-CLOCK
S-OUT
S-IN
POWER FAIL
SYSTEM SYNC
VHS SYSCON ↔ 8M SYSCON
CXP80724
8M SYSCON
MIC IN
REMOCON
KEY1
KEY2
VHS SUP. REEL
VHS T-UP REEL
VHS Y/C ↔ VHS SERVO
VHS SYSCON ↔ VHS SERVO
VHS Y/C ↔ VHS SERVO
VHS SYSCON ↔ DECK
DIGITAL LINK BLOCK
IC202
HD49756NT
MAIN SERVO
LOOP FILTER
PHASE COMPEN
IC203
GL7445
ULD
LD
DECK
T-UP SENSOR
SUP. SENSOR
CST SW
ULD
LD
MODE C
MODE B
MODE A
VHS SUP. REEL
VHS T-UP REEL
VISS DET.
DRUM
CTL HEAD
TAPE
CAPSTAN
MDA
DPG
DFG
R/C
8mm
MAIN
EDIT VCR ST HI 8 SEP SEP VHS HIFI VPS REM PDC
AM BL ST
PM M SQPB
DIGITRON
A
B
C
D
E
F
G
H
I
J
1
2
3
4
5
6
7

2. 8mm Block Diagrams

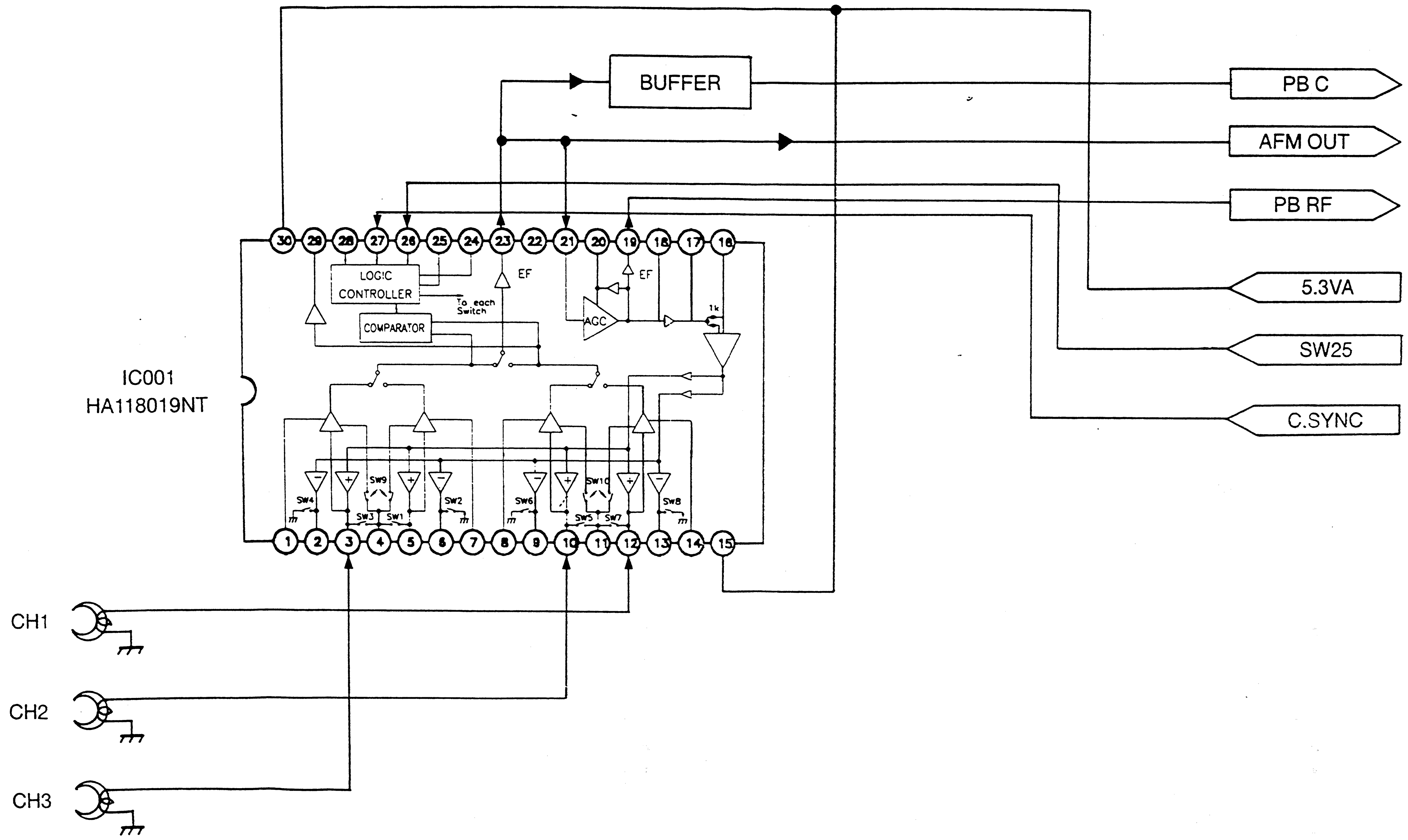
2-1. Main System (Servo, Syscon) Block Diagram


IC502 PST 523D
(RESET)
Reset
GND
Vcc
IC501 CXP80724
UNREG11V
SILE-NCE
IC507 GL7406
(D.M.DRIVE)
〈 VHS SYSCON 〉
P5207
RESET
VHS TAKE UP
VHS SUPPLY
CSO
SIO
SOO
SCKO
SYSTEM SYNC
〈 8mm Y/C 〉
IC DATA
JOG VD
STILL L
PB H
Hi-8mm
H/SW
IC CLK
〈 8mm AUDIO 〉
H/SW
AUDIO MUTE
〈 TIMER 〉
P5605
MIC DET IN L
REMOCON
KEY2
〈 DECK 〉
P5E02
MOD 0
MOD 1
MOD 2
TOP C
CST IN
HP/HG
ME/MP
TAKE UP C
REC PROOF
SUPPLY C
〈 8mm ATF 〉
SP/LP DET
CLOG
ATF ERROR
SEL1
SEL2
ATF CS
IC CLK
IC DATA
40 RESET(L)
64 VHS TAKE UP REEL
63 VHS SUPPLY REEL
44 CSO
45 SIO
46 SOO
47 SCKO
7 SYSTEM SYNC
3 JOG VD
74 STILL L
8 8mm PB H
67 Hi-8mm
1 H/SW
92 A.MUTE
42 X IN
43 X OUT
57 MIC IN L
85 REMOCON
50 KEY2
30 MOD 0
29 MOD 1
28 MOD2
60 TOP
25 CST IN
26 HP/HG
27 ME/MP
54 8mm TAKE UP
24 REC PROOF
55 8M SUPPLY
66 SP/LP DET
58 CLOG
62 ATF ERROR
100 SEL1
99 SEL2
16 ATF CS
D.PWM 76
DRUM ON 20
DRUM R/F 48
DPG 68
DFG 69
CFG 70
C.PWM 75
CAP F/R 74
CAP ON 21
FLOAD (+) 11
FLOAD (-) 12
LOAD(+) 13
LOAD (-) 14
END 59
KEY1 49
8 LED CNT 35
LPF
START CONTROL
TIMING CONTROL
OUTPUT DRIVER
DIR
〈 DRUM.M 〉
P5E04
COM UVW
DRUM U
DRUM V
DRUM W
PG+
COM PG FG
FG+
IC506 CXA1512M (C.M.DRIVE)
WAVE SHAPER
BIAS
LPF
UNREG 11V
IC505 CXA1127M (PG.FG.AMP)
FRC
STBY
POWER OFF
LOGIC
HE POWER
〈 CAPSTAN.M 〉
P5E01
FG+
FG-
CAP U
CAP V
CAP W
HE VH+
HE VH-
HW-
HW+
HV+
HV-
HU-
HU+
IC503 LB1836M (FLLD.LD.M.DRIVE)
2 IN1
6 IN2
13 IN3
9 IN4
OUT1 3
OUT2 5
OUT3 12
OUT4 9
〈 DECK 〉
P5E03
8 EL LD
7 EL UNLD
2 LOAD
1 UNLOAD
3 TOP LED
4 MOTOR GND
6 N.C
5 END
〈 KEYBOARD 〉
P5606
4 KEY1
1 8mm LED CNT
2 5VA
3 GND
8
7
6
5
4
3
2
1
A
B
C
D
E
F
G
H
I
J
K

2-2. Main Analog (Y/C, Audio) Block Diagram


5
4
3
2
1
A
B
C
D
E
F
G
VIDEO OUT
PB 5V
5.3VA
PB "H"
IC3A3
CXA1203M
23
19
17
15
TH
DL
C.SYNC
1
2
11
IC3A2
MSM7403
8
7
6
5
VGG
2fsc
V.IN
VOB
VCC
GND
V.OUT
1
2
3
4
IC3A1
HA118172
57
54
53
51
MAIN DEEMPH
NL-DEEMPH
Y/C MIX
C.SYNC
47
45
FL3A5
4.43 B.P.F
PB RF
PB EQ
8
FM DEMOD
CLAMP
COLOR KILLER
43
38
COMB
FL3A1
PB COLOR
10
L.P.F
BURST DEEMPH
11
MAIN CONV
B.P.F
COLOR DEEMPH
36
33
19
21
23
25
26
27
X3A1
4.433619
33
32
30
24
23
L.P.F
PNR DECODE
19
AUDIO OUT
42
17
B.P.F
FM DEMOD
FM AGC
16
IC4A1
LA7454W
15
SW25
1
5
10
JOG VD
SW25
AFM IN
B.P.F
FL4A1
SERIAL CLK
SERIAL DATA

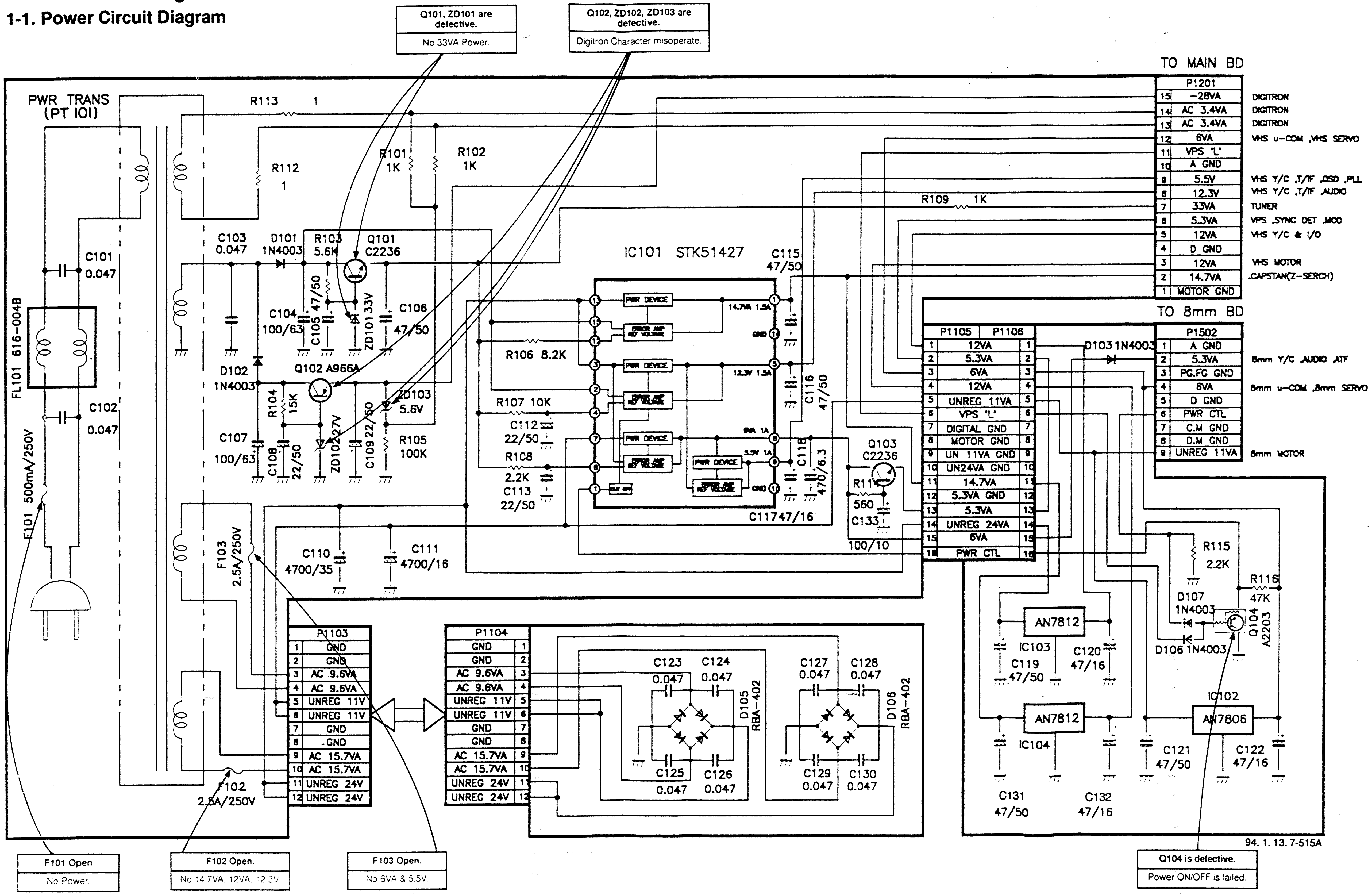
2-3. Pre-Amp Block Diagram


BUFFER
PB C
AFM OUT
PB RF
5.3VA
SW25
C.SYNC
IC001
HA118019NT
LOGIC
CONTROLLER
COMPARATOR
To each Switch
EF
EF
AGC
1k
SW1
SW2
SW3
SW4
SW5
SW6
SW7
SW8
SW9
SW10
30
29
28
27
26
25
24
23
22
21
20
19
18
17
16
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
CH1
CH2
CH3
5
4
3
2
1
A
B
C
D
E
F
G
H

CIRCUIT DIAGRAMS

1. VHS Circuit Diagrams

1-1. Power Circuit Diagram


PWR TRANS
(PT 101)
FL101 616-004B
C101 0.047
C102 0.047
F101 500mA/250V
R113 1
R112 1
R101 1K
R102 1K
C103 0.047
D101 1N4003
R103 5.6K
Q101 C2236
C104 100/63
C105 47/50
ZD101 33V
C106 47/50
D102 1N4003
Q102 A966A
R104 15K
ZD102 7V
C109 22/50
ZD103 5.6V
R105 100K
C107 100/63
C108 22/50
IC101 STK51427
PWR DEVICE
ERROR AMP REF VOLTAGE
14.7VA 1.5A
12.3V 1.5A
6VA 1A
5.5V 1A
GND
R106 8.2K
R107 10K
C112 22/50
R108 2.2K
C113 22/50
C115 47/50
C116 47/50
C118 470/6.3
C117 47/16
R109 1K
Q103 C2236
R111 560
C133 100/10
C110 4700/35
C111 4700/16
F103 2.5A/250V
F102 2.5A/250V
TO MAIN BD
P1201
15 -28VA DIGITRON
14 AC 3.4VA DIGITRON
13 AC 3.4VA DIGITRON
12 6VA VHS u-COM ,VHS SERVO
11 VPS 'L'
10 A GND
9 5.5V VHS Y/C ,T/IF ,OSD ,PLL
8 12.3V VHS Y/C ,T/IF ,AUDIO
7 33VA TUNER
6 5.3VA VPS ,SYNC DET ,MOD
5 12VA VHS Y/C & I/O
4 D GND
3 12VA VHS MOTOR
2 14.7VA ,CAPSTAN(Z-SERCH)
1 MOTOR GND
TO 8mm BD
P1502
1 A GND
2 5.3VA 8mm Y/C ,AUDIO ,ATF
3 PG.FG GND
4 6VA 8mm u-COM ,8mm SERVO
5 D GND
6 PWR CTL
7 C.M GND
8 D.M GND
9 UNREG 11VA 8mm MOTOR
D103 1N4003
P1105 P1106
1 12VA
2 5.3VA
3 6VA
4 12VA
5 UNREG 11VA
6 VPS 'L'
7 DIGITAL GND
8 MOTOR GND
9 UN 11VA GND
10 UN24VA GND
11 14.7VA
12 5.3VA GND
13 5.3VA
14 UNREG 24VA
15 6VA
16 PWR CTL
P1103
1 GND
2 GND
3 AC 9.6VA
4 AC 9.6VA
5 UNREG 11V
6 UNREG 11V
7 GND
8 -GND
9 AC 15.7VA
10 AC 15.7VA
11 UNREG 24V
12 UNREG 24V
P1104
GND 1
GND 2
AC 9.6VA 3
AC 9.6VA 4
UNREG 11V 5
UNREG 11V 6
GND 7
GND 8
AC 15.7VA 9
AC 15.7VA 10
UNREG 24V 11
UNREG 24V 12
C123 0.047
C124 0.047
C125 0.047
C126 0.047
D105 RBA-402
C127 0.047
C128 0.047
C129 0.047
C130 0.047
D108 RBA-402
AN7812
IC103
C119 47/50
C120 47/16
AN7812
IC104
C131 47/50
C132 47/16
R115 2.2K
R116 47K
D107 1N4003
D106 1N4003
Q104 A2203
IC102
AN7806
C121 47/50
C122 47/16
94. 1. 13. 7-515A

Q101, ZD101 are defective.
No 33VA Power.

Q102, ZD102, ZD103 are defective.
Digitron Character misoperate.

F101 Open
No Power.

F102 Open.
No 14.7VA, 12VA, 12.3V

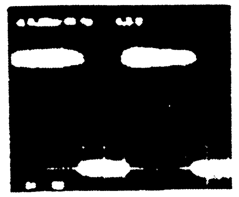
F103 Open.
No 6VA & 5.5V.

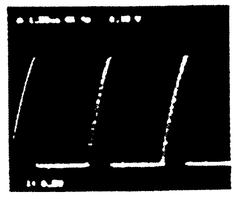
Q104 is defective.
Power ON/OFF is failed.

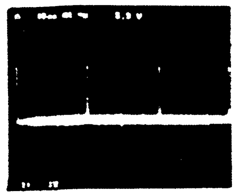
5 4 3 2 1

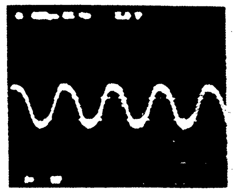
A B C D E F G

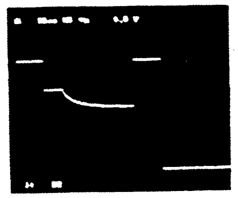
* Servo Oscilloscope Waveform

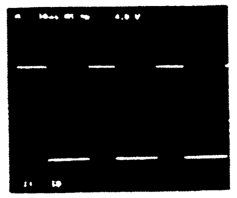
①

IC201 Pin①
TRK TRIGGER

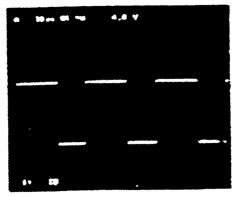
②

IC201 Pin⑥
PG M.M

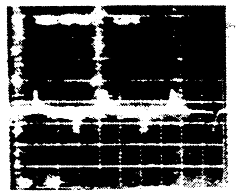
③

IC201 Pin⑦
DRUM P.G

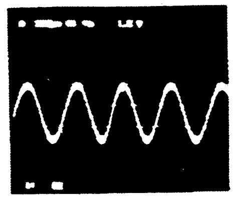
④

IC201 Pin⑨
DRUM F.G

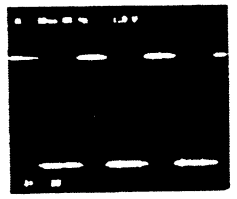
⑤

IC201 Pin㉑
SLOW CONTROL

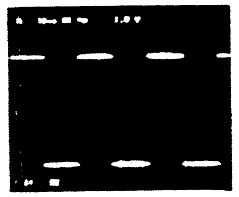
⑥

IC201 Pin㉙
REC CTL

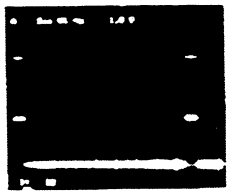
⑦

IC201 Pin㉚
REC CTL

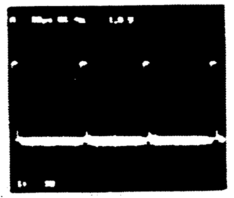
⑧

IC201 Pin㉟
REC CTL

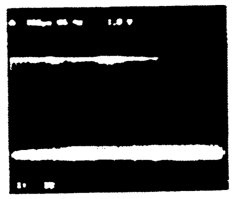
⑨

IC201 Pin㊲
CAPSTAN F.G

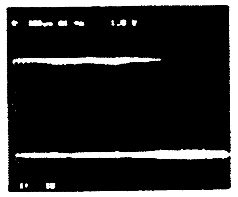
⑩

IC201 Pin㊴
CLOCK CTL

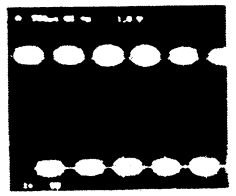
⑪

IC201 Pin㊺
SW25

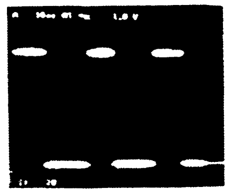
⑫

IC201 Pin㊽
DV. SYNC

⑬

IC201 Pin㊿
COMPOSITE SYNC

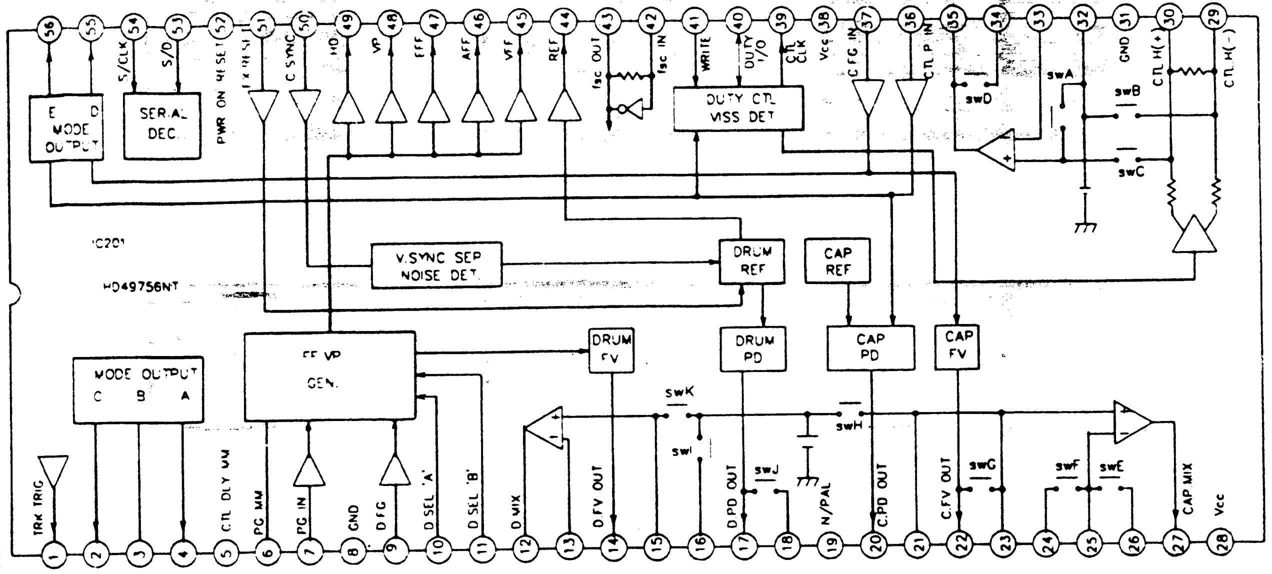
⑭

IC201 Pin(53)
SERIAL DATA

⑮

IC201 Pin(54)
SERIAL CLOCK

⑯

IC201 Pin(55)
CFG C.D

⑰

IC201 Pin(56)
CTL C.D

* Servo IC and TR Voltage Sheet
IC 201(HD49756NT)


S/CLK
S/D
PWR ON RESET
C.SYNC
HD
VP
FFF
AFF
VFF
REF
fsc OUT
fsc IN
WRITE
DUTY I/O
CLK
Vcc
C.FG IN
CTL P.M
GND
CTL H(+)
CTL H(-)
E D MODE OUTPUT
SERIAL DEC
DUTY CTL VISS DET
swA
swB
swC
swD
IC201
HD49756NT
V.SYNC SEP NOISE DET
DRUM REF
CAP REF
MODE OUTPUT C B A
FF VP GEN
DRUM FV
DRUM PD
CAP PD
CAP FV
swK
swI
swJ
swH
swG
swF
swE
TRK TRIG
CTL DLY MM
PG MM
PG IN
GND
D FG
D SEL 'A'
D SEL 'B'
D MIX
D FV OUT
D PD OUT
N/PAL
C.PD OUT
C.FV OUT
CAP MIX
Vcc

RECORD MODE	5	2.5	0.7	1.1	3.8	5	0.9	0	0	2.5	0	2.5	2.6	2.6	2.6	0	5	3.6	5	2.4	2.5	2.5	2.5	2.5	2.5	0	2.7	2.1
PLAYBACK MODE	2	2.5	0.7	1.1	3.8	5	0.2	0	0	2.5	2.5	2.5	2.6	2.6	2.6	0	5	2	5	2.4	2.5	2.5	2.5	2.5	2.5	0	2.5	2.5

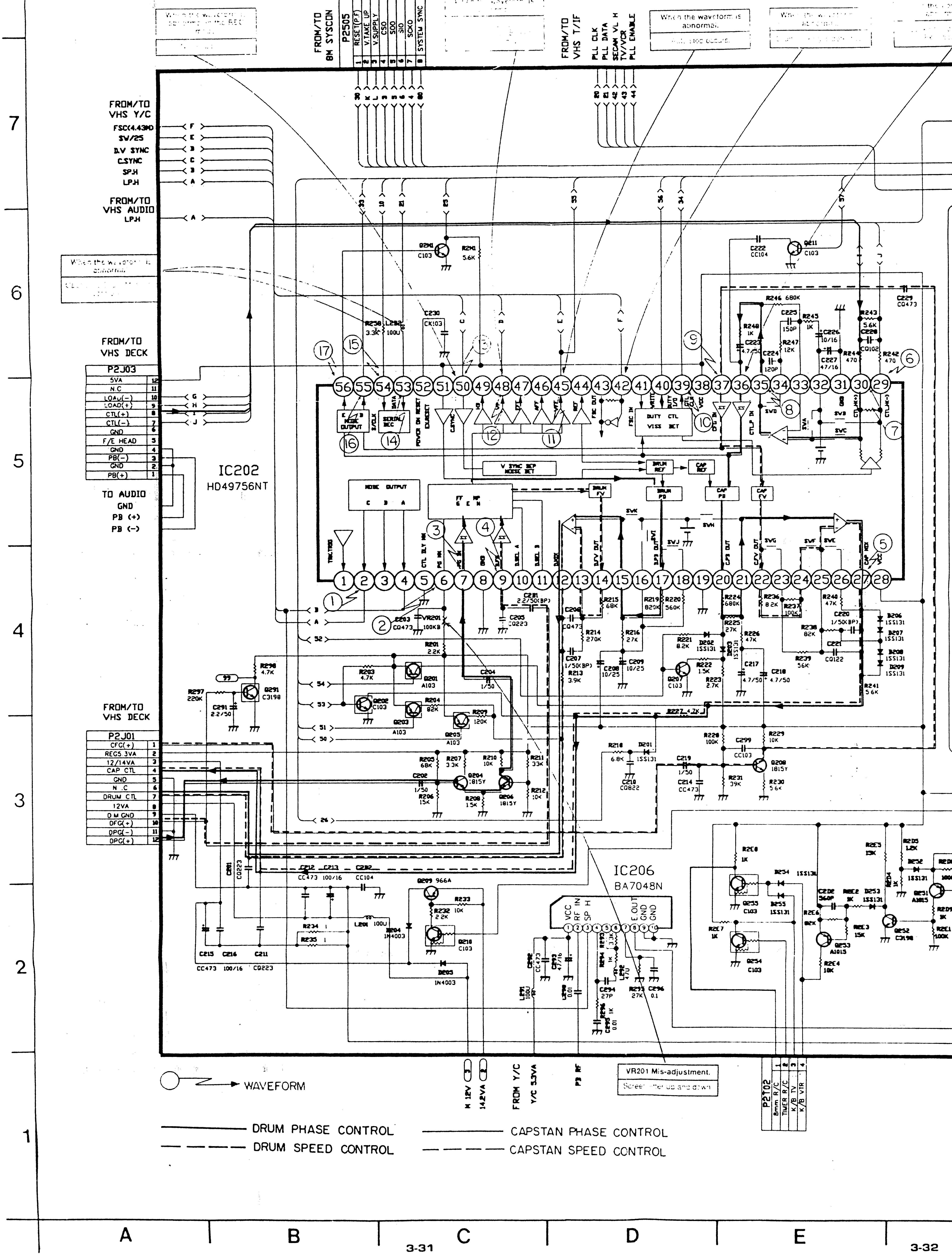
PLAYBACK MODE	3.6	0	0	5	0	0.2	2.1	0	2.7	2.7	2.7	1.4	2.5	2.5	2.5	2.5	2.5	2.4	0	2.5	2.5	2.5	2.5	2.5	2.5	2.7	2.7	5
RECORD MODE	3.6	0	0	5	0	0.2	2.1	0	2.7	2.7	2.7	1.4	2.5	2.5	2.5	2.5	2.5	2.4	0	2.5	2.5	2.5	2.5	2.5	2.5	2.6	2.7	5

*SERVO TR Voltage Sheet

(PB/REC Mode)

PORT / TR. NO.	EMITTER	COLLECTOR	BASE
Q201	5/5	2.2/2.2	5/5
Q202	0/0	2.2/2.2	0/0
Q203	5/5	1.2/1.2	5/5
Q205	5/5	1.2/1.2	5/5
Q207	0/0	5/5	0/0
Q211	0/0	0/0	0/0

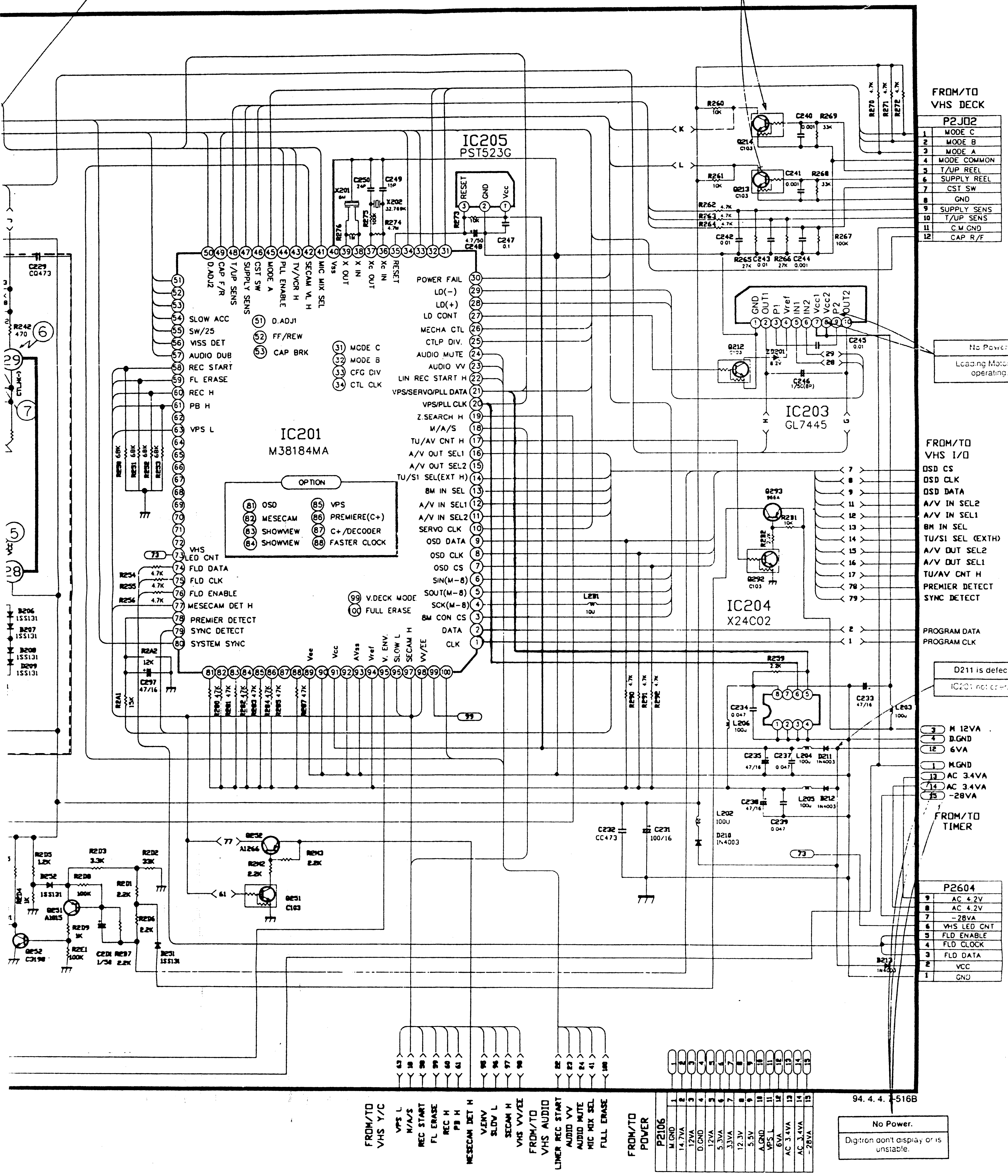
1-2. Main System (Servo, Syscon) Circuit Diagram


When the waveform is abnormal.
FROM/TO 8M SYSCON
P2505
RESET(P.F)
V.TAKE UP
V.SUPPLY
CSO
SOO
SIO
SCKO
SYSTEM SYNC
FROM/TO VHS T/IF
PLL CLK
PLL DATA
SECAM VL H
TV/VCR
PLL ENABLE
FROM/TO VHS Y/C
FSC(4.43M)
SW/25
D.V SYNC
C.SYNC
SP.H
LP.H
FROM/TO VHS AUDIO
LP.H
FROM/TO VHS DECK
P2J03
5VA
N.C
LOAD(-)
LOAD(+)
CTL(+)
CTL(-)
GND
F/E HEAD
GND
PB(-)
GND
PB(+)
TO AUDIO
GND
PB (+)
PB (-)
IC202
HD49756NT
MODE OUTPUT
SERIAL DEC
POWER ON RESET
V SYNC SEP NOISE DET
DUTY CTL
VISS DET
DRUM REF
CAP REF
DRUM FV
DRUM PD
CAP PD
CAP FV
FROM/TO VHS DECK
P2J01
CFC(+)
REG5 3VA
12/14VA
CAP CTL
GND
N.C
DRUM CTL
12VA
D.M GND
DFG(+)
DPG(-)
DPG(+)
IC206
BA7048N
VCC
RF IN
SP H
E.OUT
GND
GND
VR201 Mis-adjustment.
H 12V
14.2VA
FROM Y/C
Y/C 5.3VA
PB RF
P2T02
8mm R/C
TIMER R/C
K/B TV
K/B VTR
WAVEFORM
DRUM PHASE CONTROL
DRUM SPEED CONTROL
CAPSTAN PHASE CONTROL
CAPSTAN SPEED CONTROL
7
6
5
4
3
2
1
A
B
C
D
E

[illegible]

Q213, Q214 are defect...

Auto stop occurs


IC201
M38184MA
IC205
PST523G
RESET
GND
Vcc
IC203
GL7445
GND OUT1 P1 Vref IN1 IN2 Vcc1 Vcc2 P2 OUT2
IC204
X24C02
OPTION
(81) OSD
(82) MESECAM
(83) SHOWVIEW
(84) SHOWVIEW
(85) VPS
(86) PREMIERE(C+)
(87) C+/DECODER
(88) FASTER CLOCK
(51) D.ADJ1
(52) FF/REW
(53) CAP BRK
(31) MODE C
(32) MODE B
(33) CFG DIV
(34) CTL CLK
(99) V.DECK MODE
(100) FULL ERASE
D.ADJ2
CAP F/R
T/UP SENS
SUPPLY SENS
CST SW
MODE A
PLL ENABLE
TV/VCR H
SECAM VL H
MIC MIX SEL
Vss
X OUT
X IN
Xc OUT
Xc IN
RESET
POWER FAIL
LD(-)
LD(+)
LD CONT
MECHA CTL
CTLP DIV.
AUDIO MUTE
AUDIO VV
LIN REC START H
VPS/SERVO/PLL DATA
VPS/PLL CLK
Z.SEARCH H
M/A/S
TU/AV CNT H
A/V OUT SEL1
A/V OUT SEL2
TU/S1 SEL(EXT H)
8M IN SEL
A/V IN SEL1
A/V IN SEL2
SERVO CLK
OSD DATA
OSD CLK
OSD CS
SIN(M-8)
SOUT(M-8)
SCK(M-8)
8M CON CS
DATA
CLK
SLOW ACC
SW/25
VISS DET
AUDIO DUB
REC START
FL ERASE
REC H
PB H
VPS L
VHS LED CNT
FLD DATA
FLD CLK
FLD ENABLE
MESECAM DET H
PREMIER DETECT
SYNC DETECT
SYSTEM SYNC
Vee
Vcc
AVss
Vref
V. ENV.
SLOW L
SECAM H
VV/EE
X201 8M
X202 32.768K
C250 24P
C249 15P
R276
R275 100K
R274 4.7M
R273 10K
C248 4.7/50
C247 0.1
R260 10K
R261 10K
Q214 C103
Q213 C103
C240 0.001
R269 33K
C241 0.001
R268 33K
R262 4.7K
R263 4.7K
R264 4.7K
R270 4.7K
R271 4.7K
R272 4.7K
C242 0.01
R267 100K
R265 27K
C243 0.01
R266 27K
C244 0.001
Q212 C103
ZD201 6.2V
C245 0.01
C246 1/50(BP)
Q293 966A
R231 10K
R232 2.2K
Q292 C103
L231 10U
R239 2.2K
C234 0.047
L206 100U
C233 47/16
L203 100U
C235 47/16
C237 0.047
L204 100U
D211 1N4003
C236 47/16
L205 100U
D212 1N4003
C239 0.047
L202 100U
D210 1N4003
C232 CC473
C231 100/16
R290 4.7K
R291 4.7K
R292 4.7K
R230 68K
R231 68K
R232 68K
R233 68K
R254 4.7K
R255 4.7K
R256 4.7K
R2A2 12K
C297 47/16
R2A1 15K
R280 4.7K
R281 4.7K
R282 4.7K
R283 4.7K
R284 4.7K
R285 4.7K
R287 4.7K
Q2E2 A1266
R2H3 2.2K
R2H2 2.2K
Q2E1 C103
R205 1.2K
R203 3.3K
R202 33K
R204 1K
D2E2 1SS131
R208 100K
R201 2.2K
Q2E1 A1015
R209 1K
R206 2.2K
R2E1 100K
C2E1 1/50
R2E7 2.2K
D2E1 1SS131
Q2E2 C3198
D206 1SS131
D207 1SS131
D208 1SS131
D209 1SS131
C229 C0473
R242 470
CTL(K-)
D213 1N4003
FROM/TO
VHS DECK
P2J02
1 MODE C
2 MODE B
3 MODE A
4 MODE COMMON
5 T/UP REEL
6 SUPPLY REEL
7 CST SW
8 GND
9 SUPPLY SENS
10 T/UP SENS
11 C.M.GND
12 CAP R/F
FROM/TO
VHS I/O
OSD CS
OSD CLK
OSD DATA
A/V IN SEL2
A/V IN SEL1
8M IN SEL
TU/S1 SEL (EXTH)
A/V OUT SEL2
A/V OUT SEL1
TU/AV CNT H
PREMIER DETECT
SYNC DETECT
PROGRAM DATA
PROGRAM CLK
3 M 12VA
4 D.GND
12 6VA
1 M.GND
13 AC 3.4VA
14 AC 3.4VA
15 -28VA
FROM/TO
TIMER
P2604
9 AC 4.2V
8 AC 4.2V
7 -28VA
6 VHS LED CNT
5 FLD ENABLE
4 FLD CLOCK
3 FLD DATA
2 VCC
1 GND
FROM/TO
VHS Y/C
VPS L
M/A/S
REC START
FL ERASE
REC H
PB H
MESECAM DET H
V.ENV
SLOW L
SECAM H
VHS VV/EE
FROM/TO
VHS AUDIO
LINER REC START
AUDIO VV
AUDIO MUTE
MIC MIX SEL
FULL ERASE
FROM/TO
POWER
P2106
1 M.GND
2 14.7VA
3 12VA
4 D.GND
5 12VA
6 5.3VA
7 33VA
8 12.3V
9 5.5V
10 A.GND
11 VPS L
12 6VA
13 AC 3.4VA
14 AC 3.4VA
15 -28VA
94. 4. 4. 1-516B

No Power.

Loading Motor not operating.

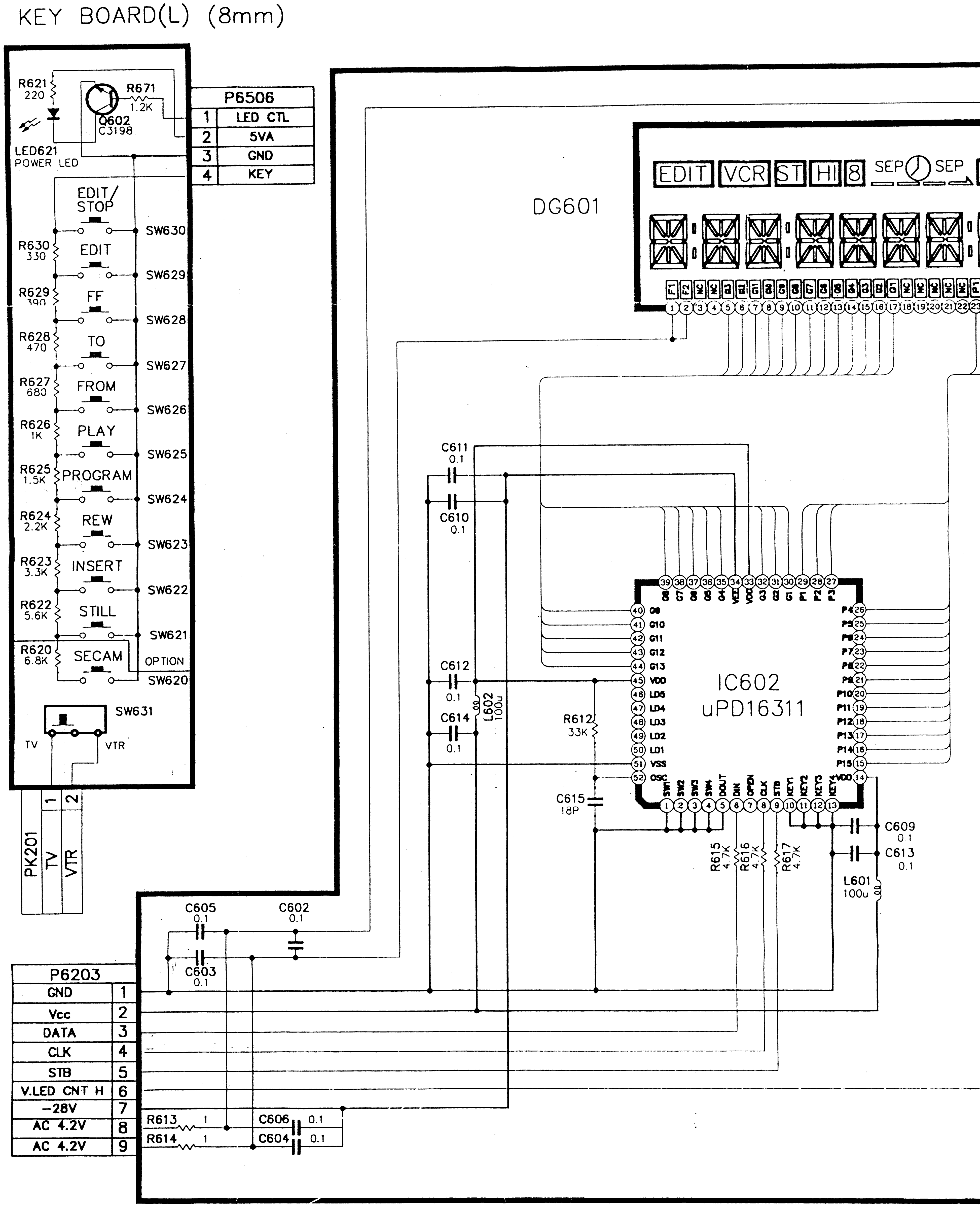
D211 is defective.

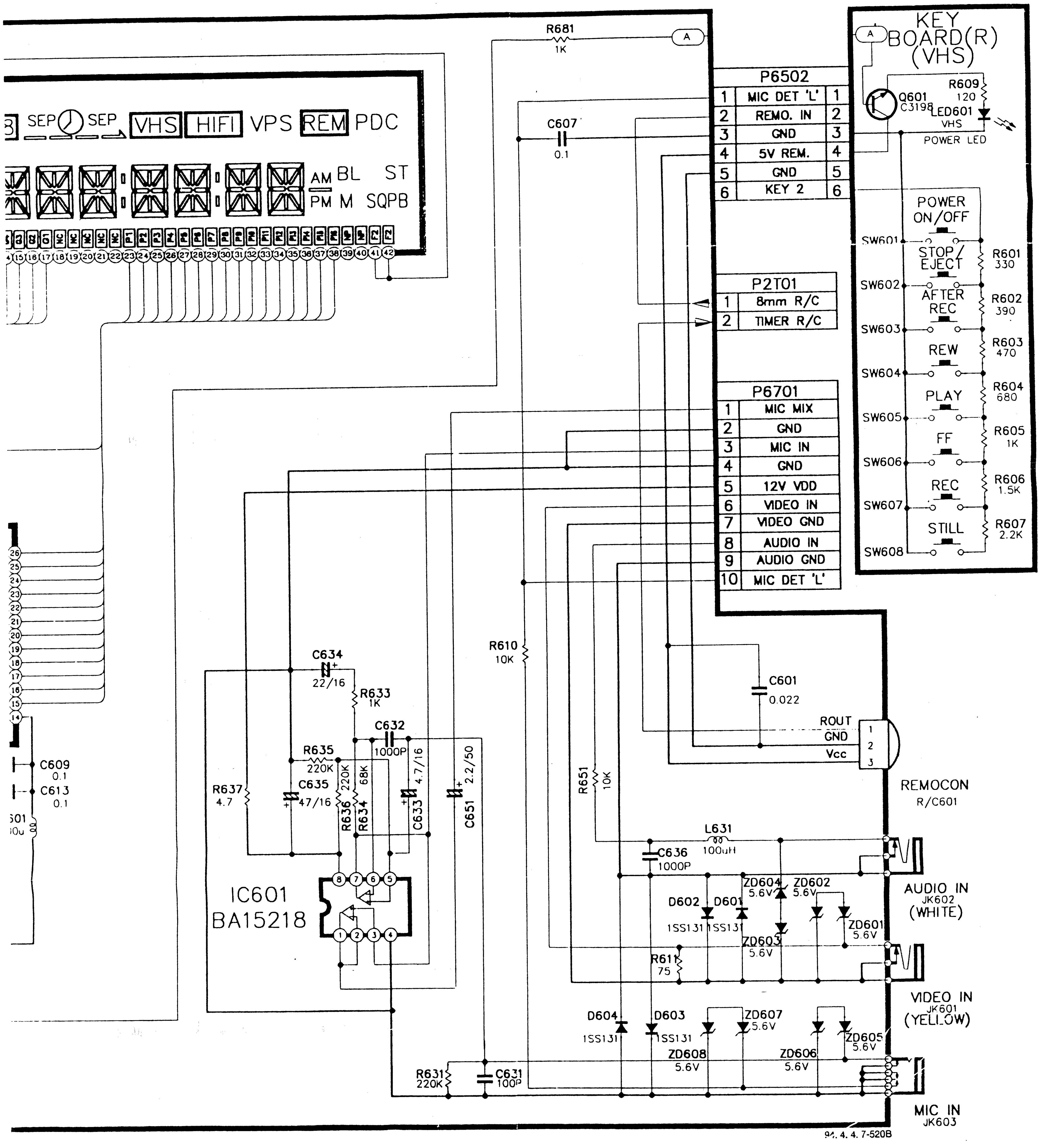
IC201 not operating.

No Power.

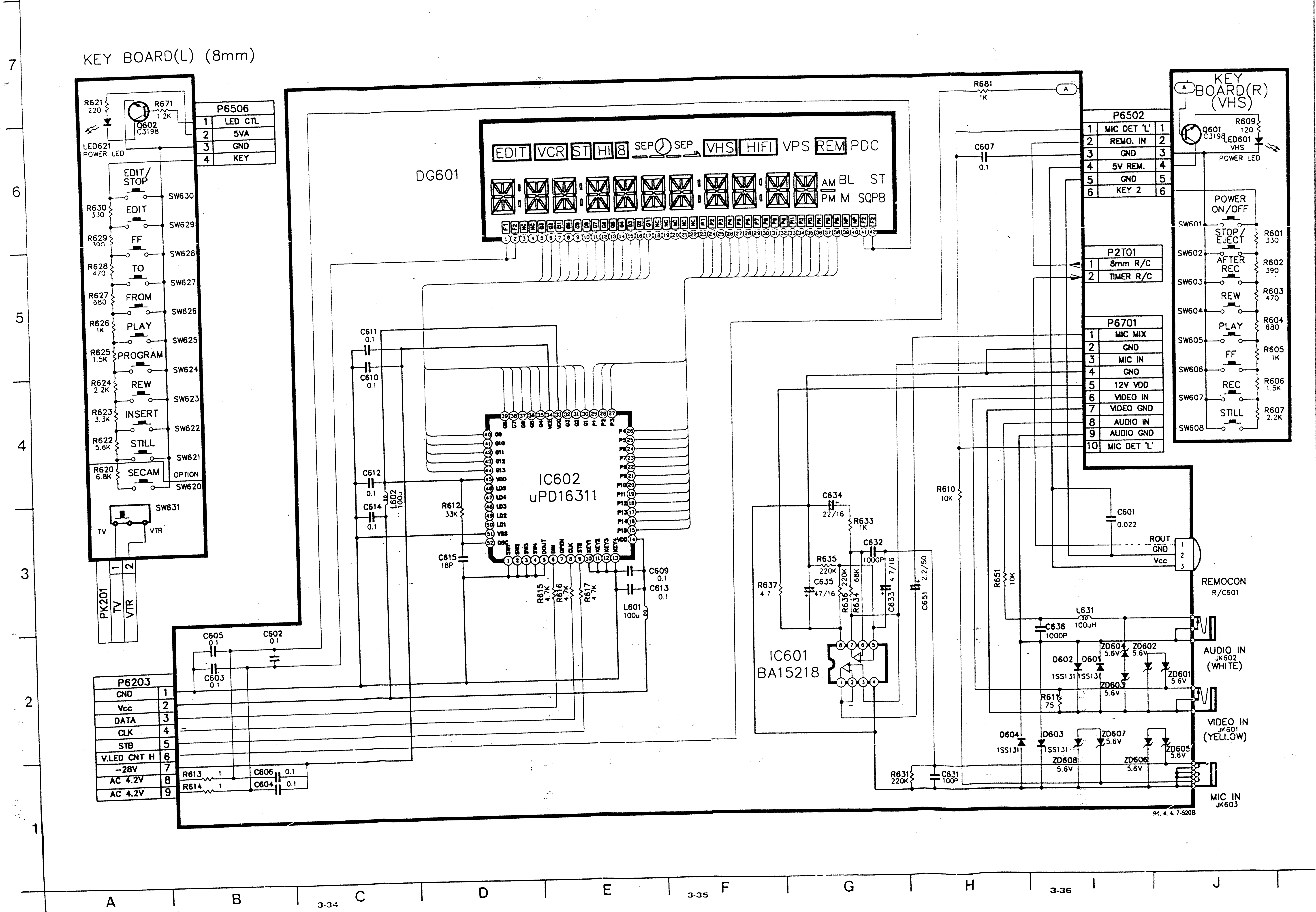
Digitron don't display or is unstable.

1-3. Timer/Key Function Circuit Diagram


KEY BOARD(L) (8mm)
R621 220
R671 1.2K
Q602 C3198
LED621 POWER LED
P6506
1 LED CTL
2 5VA
3 GND
4 KEY
EDIT/STOP
SW630
R630 330
EDIT
SW629
R629 390
FF
SW628
R628 470
TO
SW627
R627 680
FROM
SW626
R626 1K
PLAY
SW625
R625 1.5K
PROGRAM
SW624
R624 2.2K
REW
SW623
R623 3.3K
INSERT
SW622
R622 5.6K
STILL
SW621
R620 6.8K
SECAM
OPTION
SW620
SW631
TV
VTR
PK201
1 TV
2 VTR
DG601
EDIT VCR ST HI 8 SEP SEP
F1 F2 NC NC G13 G12 G11 G10 G9 G8 G7 G6 G5 G4 G3 G2 G1 NC NC NC NC P1
C611 0.1
C610 0.1
C612 0.1
C614 0.1
L602 100u
R612 33K
C615 18P
IC602
uPD16311
G9 G10 G11 G12 G13 VDD LD5 LD4 LD3 LD2 LD1 VSS OSC
G8 G7 G6 G5 G4 VEE VDD G3 G2 G1 P1 P2 P3
P4 P5 P6 P7 P8 P9 P10 P11 P12 P13 P14 P15 VDD
SW1 SW2 SW3 SW4 DOUT DIN OPEN CLK STB KEY1 KEY2 KEY3 KEY4
R615 4.7K
R616 4.7K
R617 4.7K
C609 0.1
C613 0.1
L601 100u
C605 0.1
C602 0.1
C603 0.1
P6203
GND 1
Vcc 2
DATA 3
CLK 4
STB 5
V.LED CNT H 6
−28V 7
AC 4.2V 8
AC 4.2V 9
R613 1
R614 1
C606 0.1
C604 0.1


KEY BOARD(R) (VHS)
R681 1K
A
P6502
1 MIC DET 'L'
2 REMO. IN
3 GND
4 5V REM.
5 GND
6 KEY 2
C607 0.1
Q601 C3198
R609 120
LED601 VHS
POWER LED
POWER ON/OFF
SW601
STOP/EJECT
SW602
R601 330
AFTER REC
SW603
R602 390
REW
SW604
R603 470
PLAY
SW605
R604 680
FF
SW606
R605 1K
REC
SW607
R606 1.5K
STILL
SW608
R607 2.2K
SEP SEP VHS HIFI VPS REM PDC
AM BL ST
PM M SQPB
P2T01
1 8mm R/C
2 TIMER R/C
P6701
1 MIC MIX
2 GND
3 MIC IN
4 GND
5 12V VDD
6 VIDEO IN
7 VIDEO GND
8 AUDIO IN
9 AUDIO GND
10 MIC DET 'L'
R610 10K
C634 22/16
R633 1K
C632 1000P
R635 220K
C635 47/16
R637 4.7
R636 220K
R634 68K
C633 4.7/16
C651 2.2/50
C609 0.1
C613 0.1
IC601 BA15218
C601 0.022
ROUT
GND
Vcc
REMOCON R/C601
R651 10K
L631 100uH
C636 1000P
AUDIO IN JK602 (WHITE)
D602 1SS131
D601 1SS131
ZD604 5.6V
ZD602 5.6V
ZD601 5.6V
ZD603 5.6V
R611 75
VIDEO IN JK601 (YELLOW)
D604 1SS131
D603 1SS131
ZD607 5.6V
ZD605 5.6V
ZD608 5.6V
ZD606 5.6V
R631 220K
C631 100P
MIC IN JK603
94. 4. 4. 7-520B

1-3. Timer/Key Function Circuit Diagram


KEY BOARD(L) (8mm)
R621 220
R671 1.2K
Q602 C3198
LED621 POWER LED
P6506
1 LED CTL
2 5VA
3 GND
4 KEY
EDIT/STOP SW630
R630 330
EDIT SW629
R629 390
FF SW628
R628 470
TO SW627
R627 680
FROM SW626
R626 1K
PLAY SW625
R625 1.5K
PROGRAM SW624
R624 2.2K
REW SW623
R623 3.3K
INSERT SW622
R622 5.6K
STILL SW621
R620 6.8K
SECAM OPTION SW620
SW631
TV VTR
PK201
1 TV
2 VTR
DG601
EDIT VCR ST HI 8 SEP SEP VHS HIFI VPS REM PDC
AM BL ST
PM M SQPB
R681 1K
A
C607 0.1
C611 0.1
C610 0.1
C612 0.1
C614 0.1
L602 100u
R612 33K
C615 18P
IC602
uPD16311
C609 0.1
C613 0.1
L601 100u
R615 4.7K
R616 4.7K
R617 4.7K
C605 0.1
C602 0.1
C603 0.1
P6203
GND 1
Vcc 2
DATA 3
CLK 4
STB 5
V.LED CNT H 6
-28V 7
AC 4.2V 8
AC 4.2V 9
R613 1
R614 1
C606 0.1
C604 0.1
C634 22/16
R633 1K
C632 1000P
R635 220K
C635 47/16
R637 4.7
R636 220K
R634 68K
C633 4.7/16
C651 2.2/50
IC601
BA15218
R610 10K
R651 10K
R631 220K
C631 100P
KEY BOARD(R) (VHS)
P6502
1 MIC DET 'L' 1
2 REMO. IN 2
3 GND 3
4 5V REM. 4
5 GND 5
6 KEY 2 6
Q601 C3198
R609 120
LED601 VHS POWER LED
POWER ON/OFF SW601
R601 330
STOP/EJECT SW602
R602 390
AFTER REC SW603
R603 470
REW SW604
R604 680
PLAY SW605
R605 1K
FF SW606
R606 1.5K
REC SW607
R607 2.2K
STILL SW608
P2T01
1 8mm R/C
2 TIMER R/C
P6701
1 MIC MIX
2 GND
3 MIC IN
4 GND
5 12V VDD
6 VIDEO IN
7 VIDEO GND
8 AUDIO IN
9 AUDIO GND
10 MIC DET 'L'
C601 0.022
ROUT GND Vcc
REMOCON R/C601
L631 100uH
C636 1000P
AUDIO IN JK602 (WHITE)
D602 D601 1SS131 1SS131
ZD604 5.6V
ZD602 5.6V
ZD601 5.6V
ZD603 5.6V
R611 75
VIDEO IN JK601 (YELLOW)
D604 1SS131
D603 1SS131
ZD607 5.6V
ZD608 5.6V
ZD606 5.6V
ZD605 5.6V
MIC IN JK603
94. 4. 4. 7-520B
A B C D E F G H I J
1 2 3 4 5 6 7

1-4. Pre-Amp Circuit Diagram

***Pre-Amp IC Voltage Sheet**

LP Mode PB(REC)

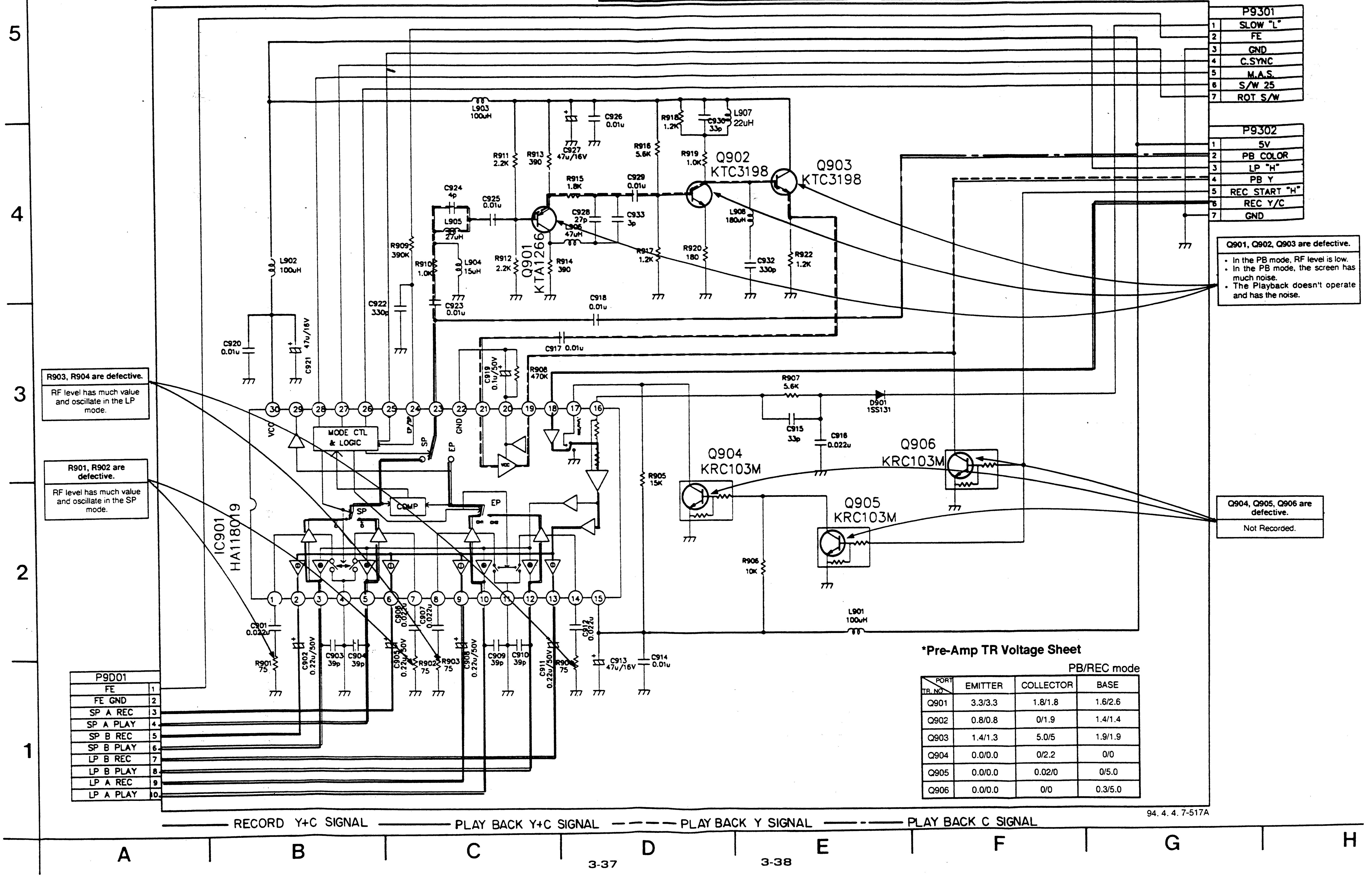
IC901(HA118019)

30					25					20				
5.0 (5.0)	2.0 (3.8)	4.7 (4.8)	0.3 (0.3)	1.3 (1.3)	2.2 (2.2)	4.9 (4.9)	3.1 (4.4)	0 (0)	2.8 (3.1)	2.2 (0.1)	2.5 (0)	4.1 (4.0)	0 (2.2)	2.7 (2.7)
1				5					10					15
4.2 (4.2)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	4.2 (4.2)	2.3 (4.2)	0 (2.1)	0.7 (2.1)	0 (0)	0.7 (2.1)	0 (2.1)	2.3 (4.2)	5 (4.8)

SP Mode PB(REC)

IC901(HA118019)

30					25					20				
5.0 (5.0)	2.0 (3.8)	4.7 (4.8)	0.3 (0.3)	1.3 (1.3)	2.2 (2.2)	0.1 (0.1)	0 (4.4)	0 (0)	2.8 (3.1)	2.3 (0.1)	2.5 (0)	4.1 (4.1)	0 (2.2)	2.7 (2.7)
1				5					10					15
2.3 (4.3)	0 (2.2)	0.7 (2.2)	0 (0)	0.7 (2.2)	0 (2.2)	2.3 (4.3)	4.2 (4.3)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	4.2 (4.2)	5.0 (4.8)


5
4
3
2
1
A
B
C
D
E
F
G
H
P9301
1 SLOW "L"
2 FE
3 GND
4 C.SYNC
5 M.A.S.
6 S/W 25
7 ROT S/W
P9302
1 5V
2 PB COLOR
3 LP "H"
4 PB Y
5 REC START "H"
6 REC Y/C
7 GND
P9D01
FE 1
FE GND 2
SP A REC 3
SP A PLAY 4
SP B REC 5
SP B PLAY 6
LP B REC 7
LP B PLAY 8
LP A REC 9
LP A PLAY 10
L903 100uH
C926 0.01u
C927 47u/16V
R911 2.2K
R913 390
R918 1.2K
C930 33p
L907 22uH
R916 5.6K
R919 1.0K
Q902 KTC3198
Q903 KTC3198
R915 1.8K
C929 0.01u
C924 4p
C925 0.01u
L905 27uH
C928 27p
C933 3p
L906 47uH
L908 180uH
R909 390K
R910 1.0K
L904 15uH
R912 2.2K
Q901 KTA1266
R914 390
R917 1.2K
R920 180
C932 330p
R922 1.2K
C922 330p
C923 0.01u
C918 0.01u
L902 100uH
C920 0.01u
C921 47u/16V
C917 0.01u
C919 0.1u/50V
R908 470K
R907 5.6K
D901 1SS131
C915 33p
C916 0.022u
R905 15K
Q904 KRC103M
Q905 KRC103M
Q906 KRC103M
R906 10K
L901 100uH
VCO
MODE CTL & LOGIC
LP/SP
SP
EP
GND
COMP
IC901 HA118019
C901 0.022u
R901 75
C902 0.22u/50V
C903 39p
C904 39p
C905 0.22u/50V
C906 0.022u
C907 0.022u
R902 75
R903 75
C908 0.22u/50V
C909 39p
C910 39p
C911 0.22u/50V
R904 75
C912 0.022u
C913 47u/16V
C914 0.01u
94. 4. 4. 7-517A

R903, R904 are defective.

RF level has much value and oscillate in the LP mode.

R901, R902 are defective.

RF level has much value and oscillate in the SP mode.

Q901, Q902, Q903 are defective.

- In the PB mode, RF level is low.
- In the PB mode, the screen has much noise.
- The Playback doesn't operate and has the noise.

Q904, Q905, Q906 are defective.

Not Recorded.

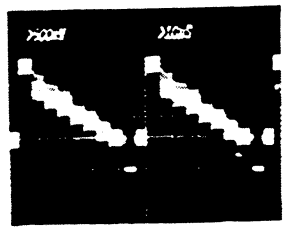
***Pre-Amp TR Voltage Sheet**

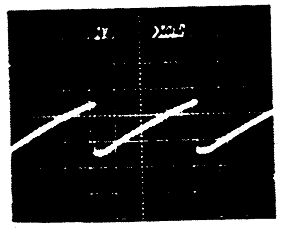
PB/REC mode

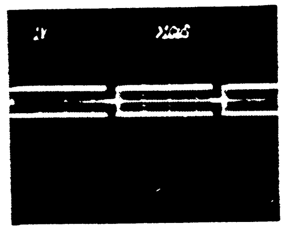
PORT / TR. NO	EMITTER	COLLECTOR	BASE
Q901	3.3/3.3	1.8/1.8	1.6/2.6
Q902	0.8/0.8	0/1.9	1.4/1.4
Q903	1.4/1.3	5.0/5	1.9/1.9
Q904	0.0/0.0	0/2.2	0/0
Q905	0.0/0.0	0.02/0	0/5.0
Q906	0.0/0.0	0/0	0.3/5.0

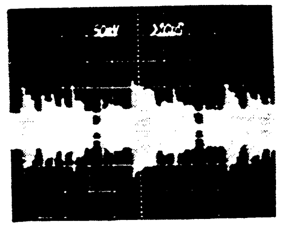
——— RECORD Y+C SIGNAL ——— PLAY BACK Y+C SIGNAL — — — PLAY BACK Y SIGNAL —·—·— PLAY BACK C SIGNAL

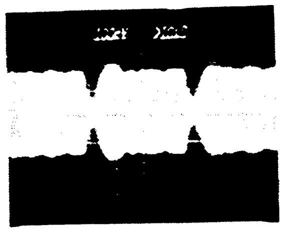
- **Y/C Oscilloscope Waveform**

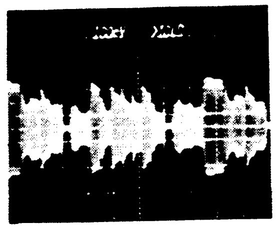
①

IC301 ㉘ PIN
Secam REC/PB
VIDEO OUTPUT

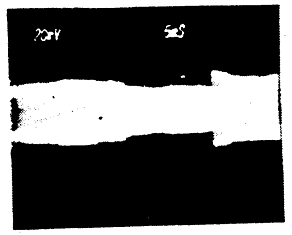
②

IC302 ㉒ PIN
Secam REC/PB
Gate Timing

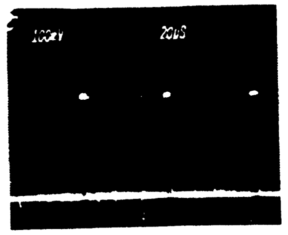
③

IC302 ㉕ PIN
Secam PB Gate
Timing Output

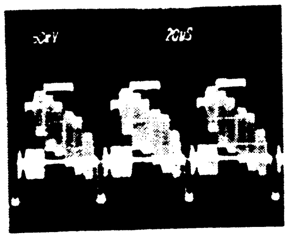
④

IC302 ⑤ PIN
REC Bell
Adjustment

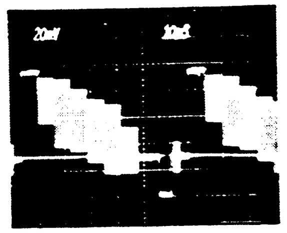
⑤

IC302 ⑤ PIN
PB input Bell
Adjustment

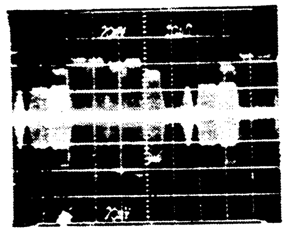
⑥

IC302 ⑩ PIN
PB out Bell
Adjustment

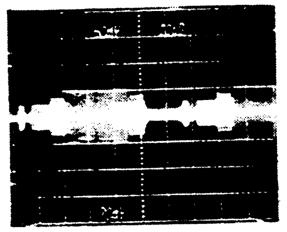
⑦

P3P02 ② PIN
PB Color Signal

⑧

IC301 ㉖ PIN
C.SYNC

⑨

IC301 ㉘ PIN
PAL REC/PB
Video Output

⑩

IC301 ㉛ PIN
PAL Video Input

⑪

IC305 ⑩ PIN
PAL PB Color Signal

⑫

IC305 ⑦ PIN
PAL RECORD
Color Signal

*Y/C TR Voltage Sheet

PB/REC Mode

PORT / TR. NO	EMITTER	COLLECTOR	BASE	REMARK
Q301	0/0	0/0	0/0	SP Mode
	0/0	0/0	4.7/4.8	LP Mode
Q302	1.5/1.6	5.1/5.0	2/2.1	
Q303	0/0	0/0	0/0	
Q304	3.6/3.0	0/0	3/2.4	
Q305	4.2/3.7	0/0	3.6/3.0	
Q306	0/0	0/0.5	5/0.2	
Q307	0/0	4.6/4.6	0.6/0.5	
Q308	1.2/0	5/0.2	1.8/0.1	
Q309	2.8/0	5/0.2	3.4/0.1	
Q310	0.9/0	1.5/0.2	1.5/0.1	
Q311	1/0	5/0.2	1.5/0.2	
Q312	0/0	0/5	5/0	
Q313	5.1/5.1	5/0.2	4.3/5.1	
Q314	1/0.6	0/0	0.4/0	
Q315	2/0.2	0/0	0/0	
Q316	2.8/0	0/0.2	3.4/0	
Q317	0/2.7	0.5/5	0/3.27	
Q318	0/0	0/0	0/0	
Q319	5.1/5.1	0/4.9	5.1/4.3	
Q320	0/0	5.1/0	0/5	
Q321	11.6/11.6	0/0	11.6/11.6	
Q322	0/0	11.6/11.6	0/0	
Q323	0.5/0.1	11.6/11.6	0/0	
Q324	0/0	0/0	0/0	
Q325	0/0.16	0/0	0/0	
Q326	0.2/0	0.2/0	4.95/0	

PAL Mode PB(REC)

IC301(LA7390)

35 30 25 20

2.5 (2.5)	0.6 (0.6)	3.7 (3.2)	3.3 (3.3)	1.4 (1.4)	3.3 (3.3)	0.6 (0.6)	5.0 (5.0)	2.0 (2.0)	0.1 (0.1)	0.5 (0.5)	4.1 (4.1)	5.0 (5.0)	2.0 (2.0)	2.0 (2.0)	2.5 (2.4)	3.3 (3.3)	3.3 (3.3)
												Secam Mode 4.2 (1.6)					
2.3 (0)	3.1 (2.4)	2.4 (2.8)	4.5 (2.8)	4.5 (2.8)	4.3 (4.3)	2.5 (2.4)	3.2 (2.2)	2.1 (2.1)	0 (0)	2.0 (2.1)	2.5 (0.5)	2.2 (1.7)	3.0 (3.0)	2.3 (2.5)	2.2 (2.2)	3.8 (3.8)	2.6 (3.4)

1 5 10 15

SECAM Mode PB(REC)

IC302(BA7107S)

30 25 20

0 (2.5)	0 (0)	3.1 (3.1)	3.1 (3.1)	5.1 (5.1)	3.3 (3.3)	0.2 (0.2)	0.5 (0.5)	1.0 (1.0)	1.4 (1.7)	1.3 (1.1)	3.8 (0.3)	2.1 (0.2)	3.3 (0.5)	2.5 (0)
2.8 (2.7)	0 (3.3)	0.5 (5.0)	0 (2.0)	1.3 (1.2)	0.5 (3.3)	0.2 (1.7)	2.4 (2.5)	1.1 (1.7)	2.3 (0)	2.9 (0.4)	3.9 (2.7)	1.4 (0)	3.8 (0.2)	5.0 (0.2)

1 5 10 15

PAL Mode PB(REC)

IC305(LA7222)

1 5 10

0 (0)	0.1 (0)	0 (0)	0.1 (0)	7.6 (7.7)	0.7 (0.1)	7.6 (7.6)	7 (7)	11.7 (11.6)	7.6 (7.6)	6.9 (6.9)	7.6 (7.7)

SECAM Mode PB(REC)

IC305(LA7222)

1 5 10

0 (0)	4.8 (4.8)	0 (0)	4.8 (4.8)	7.7 (7.7)	0.2 (0.1)	7.7 (7.7)	[illegible]	11.7 (11.6)	7.7 (7.7)	7 (6.9)	7.7 (7.7)

*Y/C IC Voltage Sheet

PAL Mode PB(REC)

IC303(BA7025L)

15 10

5.1 (5.0)	5.1 (5.0)	0 (0.1)	0 (0)	0 (0)	4.0 (3.6)	0 (0)	3.9 (3.58)	0 (0)
3.8 (3.8)	2.4 (0.2)	0 (0)	3.7 (0)	4.5 (4.5)	0 (0)	4.7 (0)	0 (0)	3.1 (3.1)

1 5

SECAM Mode PB(REC)

IC303(BA7025L)

15 10

5.1 (5.1)	5.1 (5.1)	4.5 (4.5)	0 (0)	4.3 (4.3)	3.6 (3.6)	4.4 (4.3)	3.6 (3.6)	0 (0)
3.8 (3.8)	2.4 (0.2)	0 (0)	3.7 (3.7)	4.5 (4.5)	0 (0)	2.3 (1.7)	0 (0)	1.9 (3.1)

1 5

PB(REC)

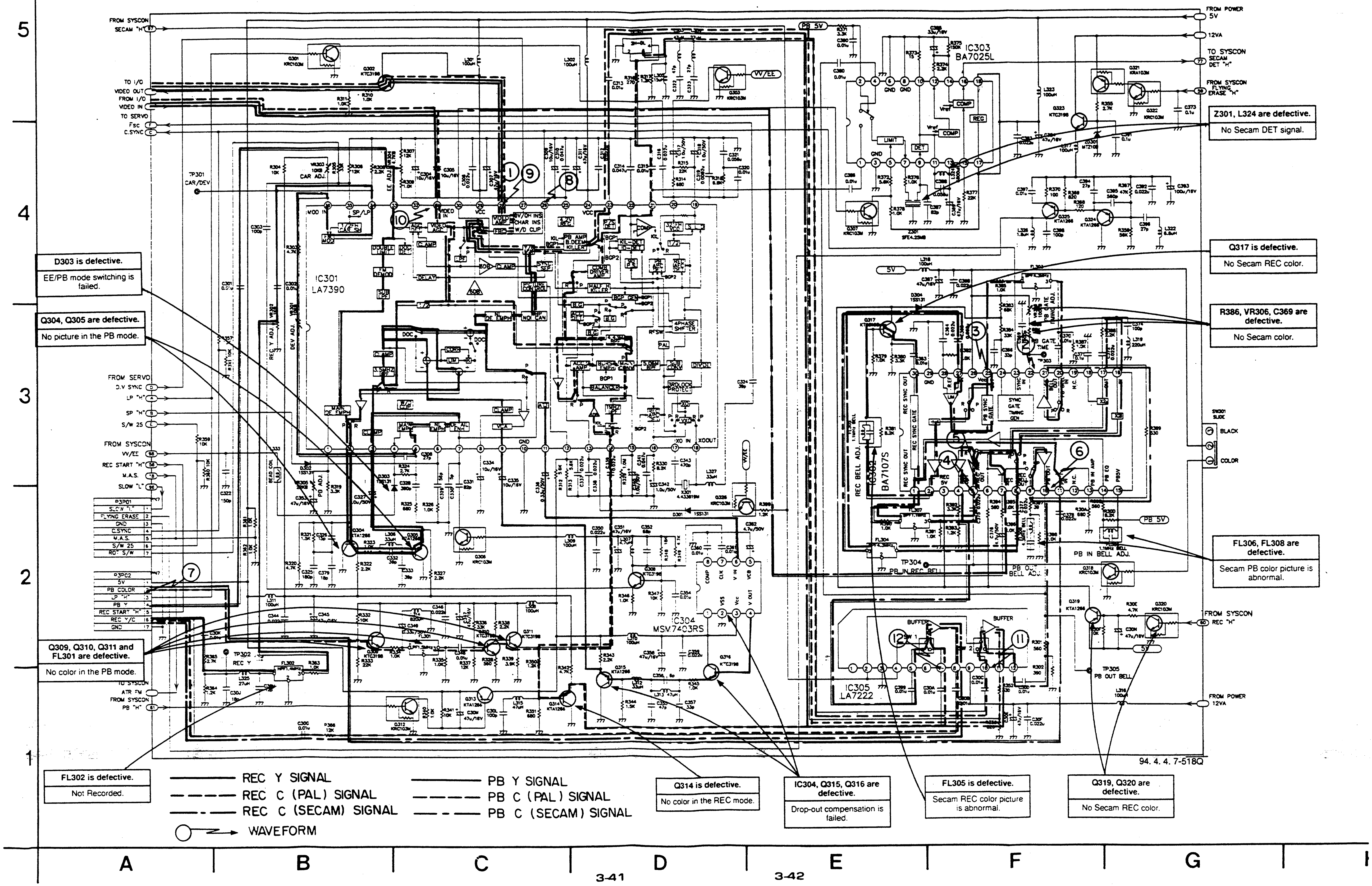
IC304
(MSM7403RS)

5

8 (0.2)	2 (0.1)	2 (0.2)	2 (0.3)
4.85 (0.2)	0 (0)	4.85 (0.2)	3.3 (0.1)

1

1-5. Y/C Circuit Diagram


FROM SYSCON
SECAM "H"
TO I/O
VIDEO OUT
FROM I/O
VIDEO IN
TO SERVO
Fsc
C.SYNC
TP301
CAR/DEV
IC301
LA7390
IC302
BA7107S
IC303
BA7025L
IC304
MSV7403RS
IC305
LA7222
PB 5V
W/EE
FROM POWER
5V
12VA
TO SYSCON
SECAM
DET "H"
FROM SYSCON
FLYING
ERASE "H"
FROM SERVO
D.V SYNC
LP "H"
SP "H"
S/W 25
FROM SYSCON
W/EE
REC START "H"
M.A.S.
SLOW "L"
TP302
REC Y
TP304
PB IN REC BELL
PB IN BELL ADJ.
PB OUT BELL ADJ.
TP305
PB OUT BELL
SW301
SLIDE
BLACK
COLOR
FROM SYSCON
REC "H"
FROM POWER
12VA
TO SYSCON
ATR FM
FROM SYSCON
PB "H"
BUFFER
94. 4. 4. 7-518Q
A
B
C
D
E
F
G
1
2
3
4
5

D303 is defective.
EE/PB mode switching is failed.

Q304, Q305 are defective.
No picture in the PB mode.

Q309, Q310, Q311 and FL301 are defective.
No color in the PB mode.

FL302 is defective.
Not Recorded.

Z301, L324 are defective.
No Secam DET signal.

Q317 is defective.
No Secam REC color.

R386, VR306, C369 are defective.
No Secam color.

FL306, FL308 are defective.
Secam PB color picture is abnormal.

Q314 is defective.
No color in the REC mode.

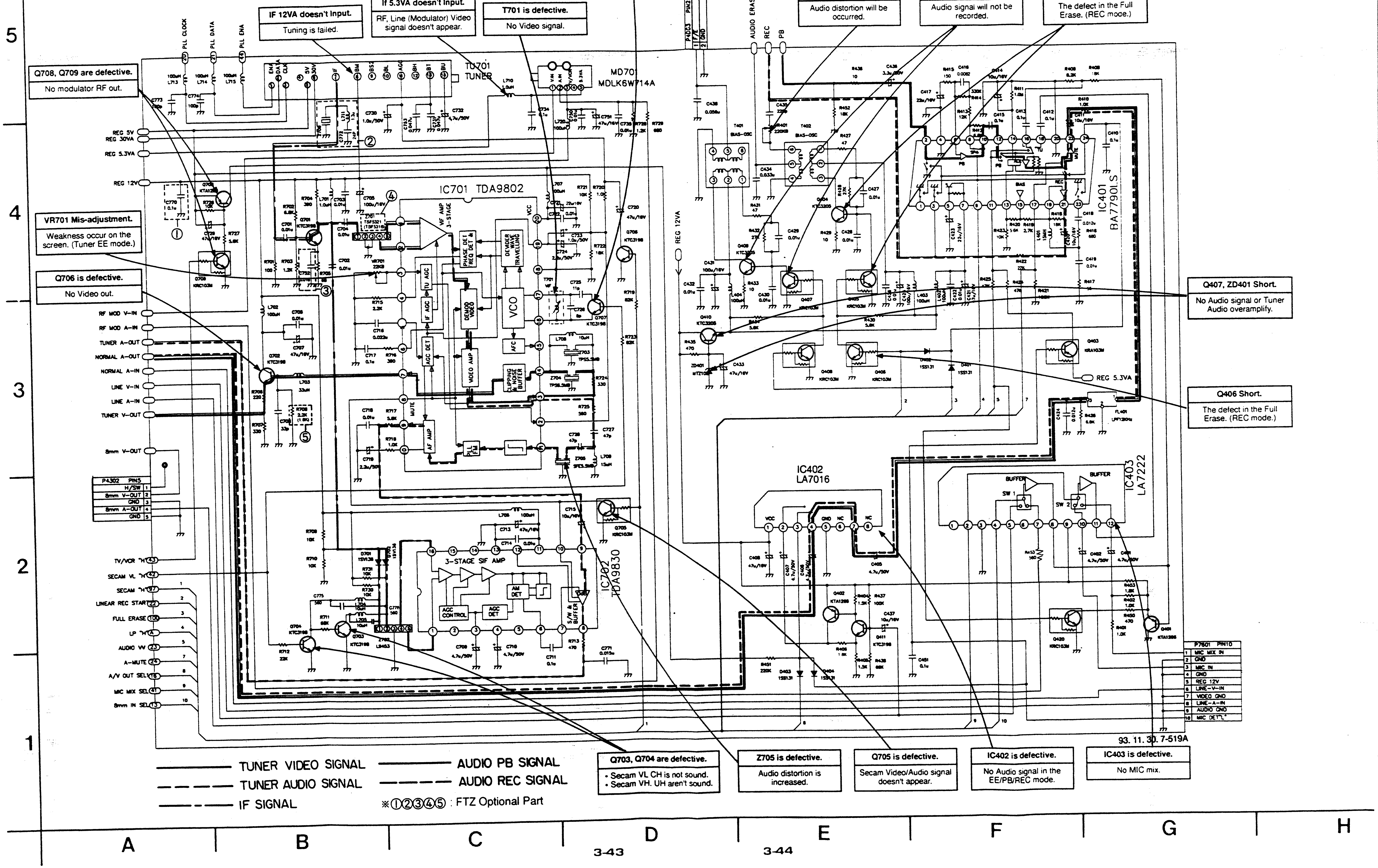
IC304, Q315, Q316 are defective.
Drop-out compensation is failed.

FL305 is defective.
Secam REC color picture is abnormal.

Q319, Q320 are defective.
No Secam REC color.

REC Y SIGNAL
REC C (PAL) SIGNAL
REC C (SECAM) SIGNAL
PB Y SIGNAL
PB C (PAL) SIGNAL
PB C (SECAM) SIGNAL
WAVEFORM

1-6. Tuner/IF & Audio Circuit Diagram


PLL CLOCK
PLL DATA
PLL ENA
TU701 TUNER
MD701 MDLK6W714A
IC701 TDA9802
VIF AMP 3-STAGE
PHASE DET & FREQ DET
DEMOD VIDEO
VIDEO AMP
VCO
AFC
TU AGC
IF AGC
AGC DET
CLIPPING & NOISE BUFFER
DEVIDER WAVE TRAVELLING
AF AMP
MUTE
IC702 TDA9830
3-STAGE SIF AMP
AGC CONTROL
AGC DET
AM DET
S/W & BUFFER
IC401 BA7790LS
IC402 LA7016
IC403 LA7222
BUFFER
SW 1
SW 2
AUDIO ERASE
REC
PB
REG 12VA
REG 5.3VA
REG 5V
REG 30VA
REG 12V
RF MOD V-IN
RF MOD A-IN
TUNER A-OUT
NORMAL A-OUT
NORMAL A-IN
LINE V-IN
LINE A-IN
TUNER V-OUT
8mm V-OUT
P4302 PIN5
1 H/SW
2 8mm V-OUT
3 GND
4 8mm A-OUT
5 GND
TV/VCR "H"
SECAM VL "H"
SECAM "H"
LINEAR REC START
FULL ERASE
LP "H"
AUDIO W
A-MUTE
A/V OUT SEL
MIC MIX SEL
8mm IN SEL
P7601 PIN10
1 MIC MIX IN
2 GND
3 MIC IN
4 GND
5 REG 12V
6 LINE-V-IN
7 VIDEO GND
8 LINE-A-IN
9 AUDIO GND
10 MIC DET"L"
93. 11. 30. 7-519A
A
B
C
D
E
F
G
H
1
2
3
4
5

Q708, Q709 are defective.
No modulator RF out.

IF 12VA doesn't Input.
Tuning is failed.

If 5.3VA doesn't Input.
RF, Line (Modulator) Video signal doesn't appear.

T701 is defective.
No Video signal.

Q707 is defective.
Secam VHF L CH picture is bad.

VR401 Mis-adjustment.
Audio distortion will be occurred.

Q407, Q409 Short.
Audio signal will not be recorded.

Q404, Q405 Short.
The defect in the Full Erase. (REC mode.)

VR701 Mis-adjustment.
Weakness occur on the screen. (Tuner EE mode.)

Q706 is defective.
No Video out.

Q407, ZD401 Short.
No Audio signal or Tuner Audio overamplify.

Q406 Short.
The defect in the Full Erase. (REC mode.)

Q703, Q704 are defective.
- Secam VL CH is not sound.
- Secam VH. UH aren't sound.

Z705 is defective.
Audio distortion is increased.

Q705 is defective.
Secam Video/Audio signal doesn't appear.

IC402 is defective.
No Audio signal in the EE/PB/REC mode.

IC403 is defective.
No MIC mix.

TUNER VIDEO SIGNAL
TUNER AUDIO SIGNAL
IF SIGNAL
AUDIO PB SIGNAL
AUDIO REC SIGNAL
※①②③④⑤ : FTZ Optional Part

*Tuner/IF TR Voltage Sheet

PAL/SECAM

PORT / TR. NO	EMITTER	COLLECTOR	BASE
Q701	1.1/1.1	5.5/5.5	1.8/1.8
Q702	1.6/1.7	12.0/12.0	2.2/2.3
Q703	0.0/0.0	0.0/0.0	0.6/0.6
Q704	0.0/0.0	10.5/10.5	0.0/0.0
Q705	0.0/0.0	3.2/0.0	0.0/4.8
Q706	0.0/0.0	4.6/0.0	0.0/0.6
Q707	2.6/2.6	0.5/0.5	0.0/0.0
Q708	5.0/5.0	4.6/4.6	4.2/4.2
Q709	0.0/0.0	0.0/0.0	5.0/5.0

*Tuner/IF IC Voltage Sheet

PAL(SECAM) Mode

IC701(TDA9802)

4.9 (4.9)	3.1 (2.9)	0.0 (0.0)	2.6 (2.6)	2.6 (2.6)	4.7 (4.7)	1.9 (2.0)	2.0 (2.0)	4.9 (5.3)	2.6 (2.6)
20					15				
1				5					10
3.3 (3.3)	3.3 (3.3)	0.8 (0.8)	0.2 (0.2)	3.1 (1.8)	2.5 (2.5)	2.2 (2.3)	3.2 (0.0)	2.0 (2.1)	1.5 (1.4)

PAL(SECAM) Mode

IC702(TDA9830)

1.8 (1.8)	0.0 (0.0)	6.3 (6.3)	0.0 (0.0)	3.2 (3.2)	12.0 (12.0)	3.2 (0.0)	2.3 (2.3)
	15					10	
1				5			
1.8 (1.8)	0.0 (0.0)	2.2 (2.1)	4.3 (4.3)	0.0 (0.0)	2.2 (2.2)	2.3 (2.3)	2.3 (2.3)

*Tuner

Mode: PAL(11CH), SECAM(28CH)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
PAL	0.1	0.1	0	0.1	5.0	31.2	0.0	12.0	0	0.0	5.0	11.8	19.0	0.0
SECAM	0.1	0.1	0.0	0.1	5.0	30.3	0.0	12.0	0.7	0.0	7.7	0.0	4.4	11.7

*Modulator

	1	2	3	4	5
PAL	0.0	0.0	4.5	0.0	4.9
SECAM	0.0	0.0	4.5	0.0	4.9

*Audio TR Voltage Sheet

PB/REC Mode

PORT / TR NO	EMITTER	COLLECTOR	BASE
Q401	0.0/7.5	0.0/0.0	7.0/6.9
Q402	11.6/11.5	7.4/7.3	10.9/10.8
Q403	4.7/4.7	4.8/0.4	4.6/4.6
Q404	0.0/0.4	8.9/8.8	0.0/0.8
Q405	0.0/0.0	0.0/0.8	7.3/0.0
Q406	0.0/0.0	7.3/0.0	0.0/4.6
Q407	0.0/0.0	0.0/0.9	7.4/0.0
Q408	0.0/0.0	7.4/0.0	0.0/4.9
Q409	0.0/0.5	9.0/8.8	0.0/0.9
Q410	9.0/3.9	11.6/11.5	9.5/9.5
Q411	4.0/4.0	11.0/10.8	4.6/4.5
Q420	0.0/0.0	0.0/7.5	4.9/0.0

*Audio IC Voltage Sheet

PB(REC)

IC401(BA7790LS)

3.4 (3.4)	0.0 (0.0)	3.4 (3.4)	3.5 (3.5)	3.5 (3.5)	4.1 (4.1)	0.0 (0.0)	4.1 (4.1)	4.1 (4.1)	0.0 (0.0)	4.1 (4.1)	1.1 (4.7)
				10					20		
1		5					15				
0.0 (0.0)	0.0 (0.0)	8.8 (8.8)	8.9 (8.9)	0.0 (0.0)	4.9 (0.4)	2.6 (2.6)	4.1 (4.1)	0.0 (0.0)	4.1 (4.1)	4.1 (4.1)	0.0 (0.0)

PB(REC)

IC402(LA7016)

1				5			8
11.6 (11.5)	7.6 (7.5)	0.3 (0.3)	6.9 (6.8)	0.0 (0.0)	0.0 (0.0)	7.6 (7.5)	0.0 (0.0)

PB(REC)

IC403(LA7222)

1				5					10		
0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	7.7 (7.6)	0.0 (0.0)	7.7 (7.6)	7.0 (6.9)	11.6 (11.5)	7.7 (7.6)	7.0 (6.9)	7.7 (7.6)

*In/Out IC Voltage Sheet

IC801(LA7954)

1				5				9	
4.3	0	0	4.9	0	4.9	11.7	4.9	5	TU
4.3	5	0	4.9	0	4.9	11.7	4.9	5	S1
4.3	0	5	4.9	0	4.9	11.7	4.9	5	S2
4.3	5	5	4.9	0	4.9	11.7	4.9	5	A/V

IC803(LA7954)

1				5				9	
4.2	0	0	4.9	0	4.9	11.7	4.9	5	TU
4.2	5	0	4.9	0	4.9	11.7	4.9	5	S1
4.2	0	5	4.9	0	4.9	11.7	4.9	5	S2
4.2	5	5	4.9	0	4.9	11.7	4.9	5	A/V

TITLE OFF (ON)

IC806(NJM2249L)

1				5			8
2.9 (2.9)	0 (1.5)	2.8 (2.8)	0 (1.1)	3.2 (3.2)	6.4 (6.4)	2.1 (2.1)	0 (0)

TU

IC802(LA7222)

1				5					10		
0	0	0	0	7.7	0	7.7	7	11.7	7.7	7	7.7

TU

IC804(LA7222)

1				5					10		
0	0	0	0	7.7	0	7.7	7	11.7	7.7	7	7.7

TU

IC805(NJM2245S)

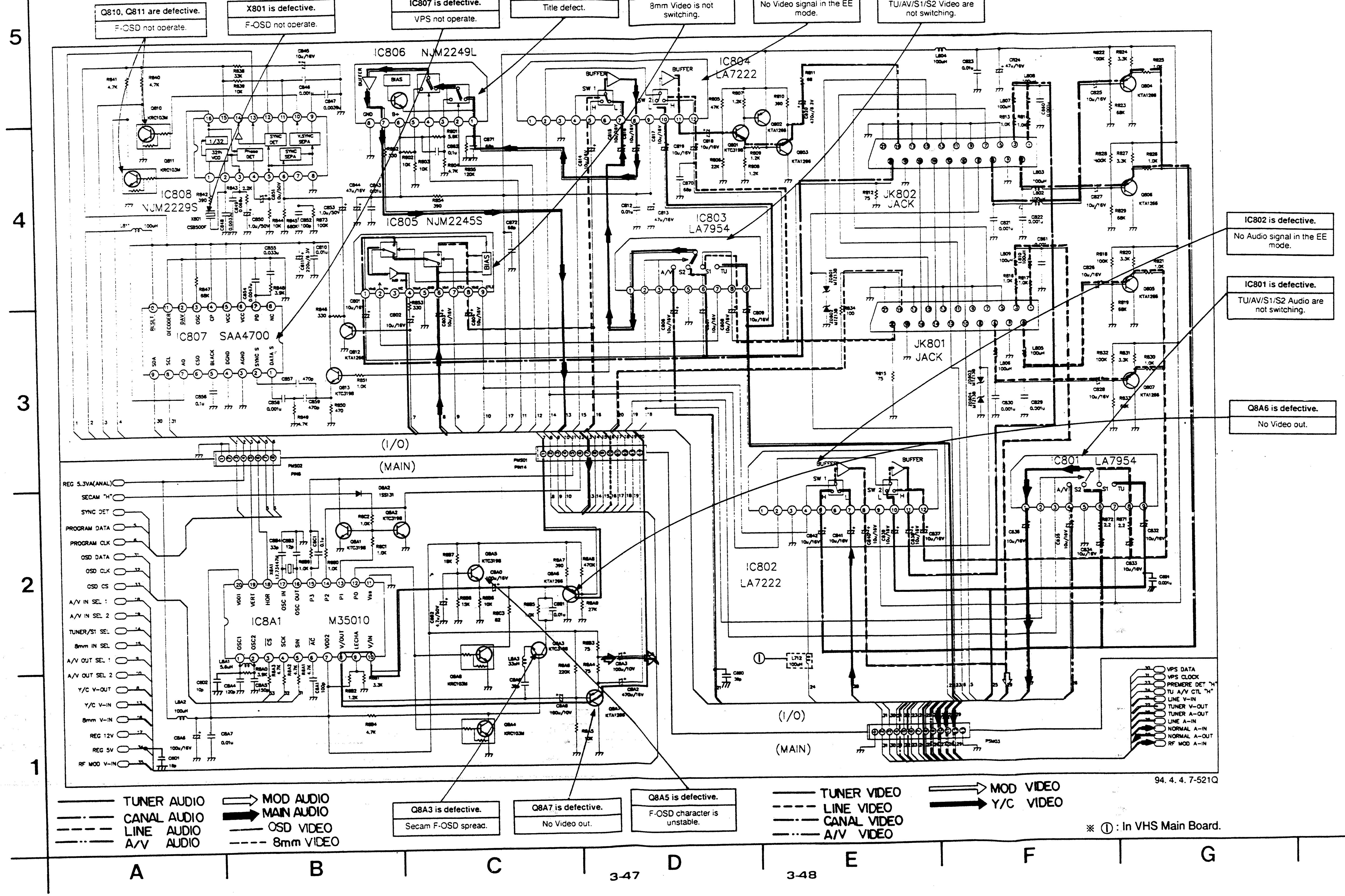
1				5				9
8	11.7	0	6.1	0	7.9	0	8	0

TU

IC808(NJM2249S)

0.3	4.8	0	4.1	1.8	0.6	0.1	0.2
	15					10	
1				5			
2.5	2	2.1	0	0.5	3.7	2.9	0

1-7. Scart In/Out & Function OSD Circuit Diagram


IC806 NJM2249L
IC804 LA7222
IC808 NJM2229S
IC805 NJM2245S
IC803 LA7954
IC807 SAA4700
JK802 JACK
JK801 JACK
IC801 LA7954
IC802 LA7222
IC8A1 M35010
BUFFER
SW 1
SW 2
BIAS
A/V
S2
S1
TU
(I/O)
(MAIN)
PMS02
PMS01
PMS03
REG 5.3VA(ANAL)
SECAM "H"
SYNC DET
PROGRAM DATA
PROGRAM CLK
OSD DATA
OSD CLK
OSD CS
A/V IN SEL 1
A/V IN SEL 2
TUNER/S1 SEL
8mm IN SEL
A/V OUT SEL 1
A/V OUT SEL 2
Y/C V-OUT
Y/C V-IN
8mm V-IN
REG 12V
REG 5V
RF MOD V-IN
VPS DATA
VPS CLOCK
PREMERE DET "H"
TU A/V CTL "H"
LINE V-IN
TUNER V-OUT
TUNER A-OUT
LINE A-IN
NORMAL A-IN
NORMAL A-OUT
RF MOD A-IN
5
4
3
2
1
A
B
C
D
E
F
G

Q810, Q811 are defective.
F-OSD not operate.

X801 is defective.
F-OSD not operate.

IC807 is defective.
VPS not operate.

IC806 is defective.
Title defect.

IC805 is defective.
8mm Video is not switching.

IC804 is defective.
No Video signal in the EE mode.

IC803 is defective.
TU/AV/S1/S2 Video are not switching.

IC802 is defective.
No Audio signal in the EE mode.

IC801 is defective.
TU/AV/S1/S2 Audio are not switching.

Q8A6 is defective.
No Video out.

Q8A3 is defective.
Secam F-OSD spreac.

Q8A7 is defective.
No Video out.

Q8A5 is defective.
F-OSD character is unstable.

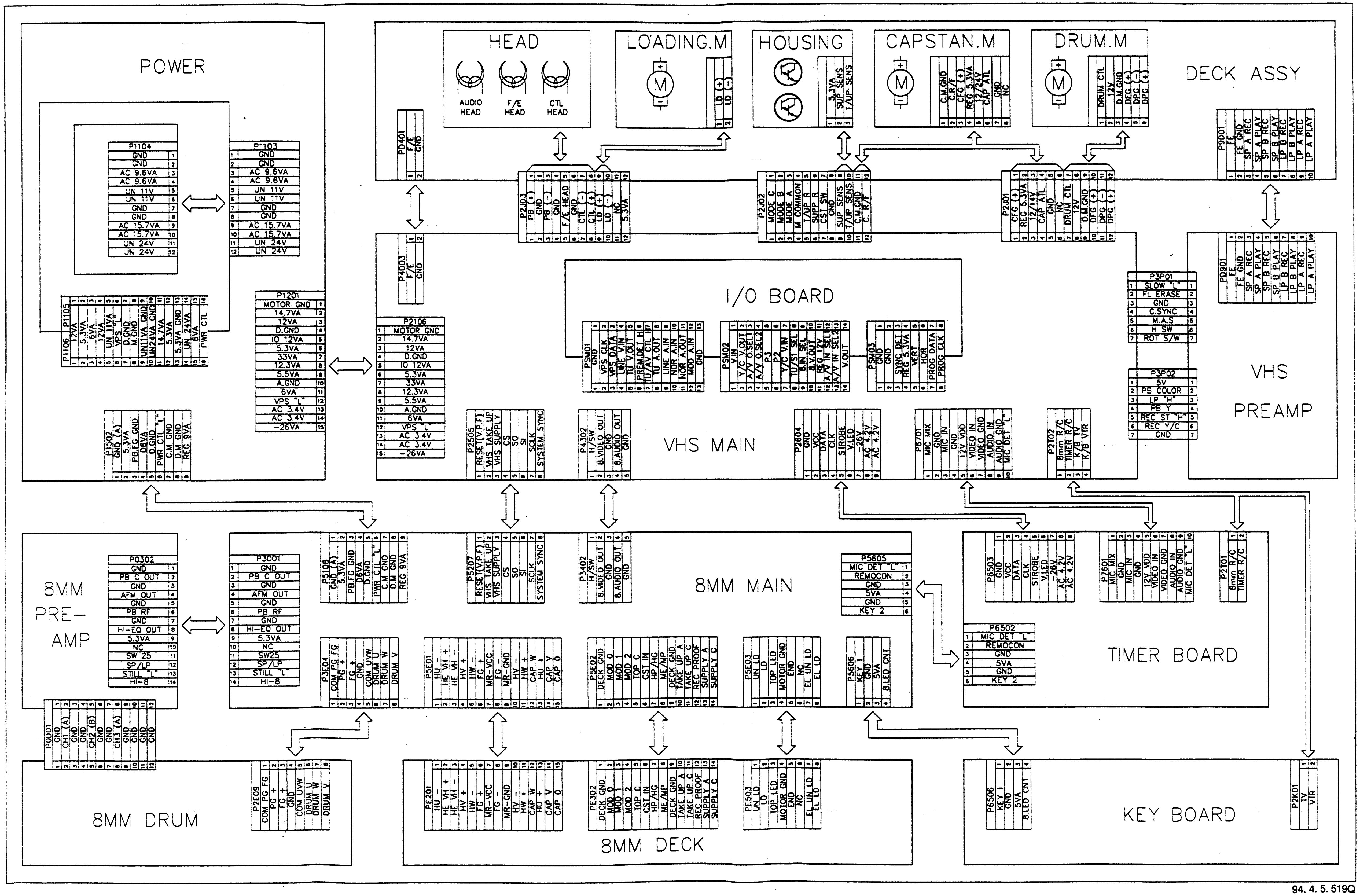
94. 4. 4. 7-521Q

——— TUNER AUDIO
—·—·— CANAL AUDIO
– – – LINE AUDIO
—··— A/V AUDIO
⇨ MOD AUDIO
➡ MAIN AUDIO
——— OSD VIDEO
– – – 8mm VIDEO
——— TUNER VIDEO
– – – LINE VIDEO
—·—·— CANAL VIDEO
—··— A/V VIDEO
⇨ MOD VIDEO
➡ Y/C VIDEO

※ ①: In VHS Main Board.

1-8. Connection Diagram

4
3
2
1


POWER
P1104
GND
GND
AC 9.6VA
AC 9.6VA
UN 11V
UN 11V
GND
GND
AC 15.7VA
AC 15.7VA
UN 24V
UN 24V
P1103
P1105
P1106
P1201
MOTOR GND
14.7VA
12VA
D.GND
IO 12VA
5.3VA
33VA
12.3VA
5.5VA
A.GND
6VA
VPS "L"
AC 3.4V
AC 3.4V
-26VA
P1502
DECK ASSY
HEAD
AUDIO HEAD
F/E HEAD
CTL HEAD
LOADING.M
LD (+)
LD (-)
HOUSING
5.3VA
SUP SENS
T/UP SENS
CAPSTAN.M
C.M.GND
C.R/F
CFG (+)
REG 5.3VA
12/24V
CAP ATL
GND
NC
DRUM.M
DRUM CTL
12V
D.M.GND
DFG (+)
DPG (+)
P0401
F/E
GND
P2J03
P2J02
P3J01
P9001
P4003
P2106
MOTOR GND
14.7VA
12VA
D.GND
IO 12VA
5.3VA
33VA
12.3VA
5.5VA
A.GND
6VA
VPS "L"
AC 3.4V
AC 3.4V
-26VA
I/O BOARD
PSM01
PSM02
PSM03
VHS MAIN
P2505
P4302
P2804
P6701
P2T02
P3P01
SLOW "L"
FL ERASE
GND
C.SYNC
M.A.S
H SW
ROT S/W
P3P02
5V
PB COLOR
LP "H"
PB Y
REC ST "H"
REC Y/C
GND
P0901
VHS PREAMP
8MM PRE-AMP
P0302
GND
PB C OUT
GND
AFM OUT
GND
PB RF
GND
HI-EQ OUT
5.3VA
NC
SW 25
SP/LP
STILL "L"
HI-8
P3001
GND
PB C OUT
GND
AFM OUT
GND
PB RF
GND
HI-EQ OUT
5.3VA
NC
SW25
SP/LP
STILL "L"
HI-8
P5108
P5207
P3402
8MM MAIN
P5605
MIC DET "L"
REMOCON
GND
5VA
GND
KEY 2
P3E04
P5E01
P5E02
P5E03
P5606
P0001
P6503
P7601
P2T01
P6502
MIC DET "L"
REMOCON
GND
5VA
GND
KEY 2
TIMER BOARD
8MM DRUM
P2E09
8MM DECK
PE201
PE302
PE503
P6506
P2K01
KEY BOARD

94. 4. 5. 519Q

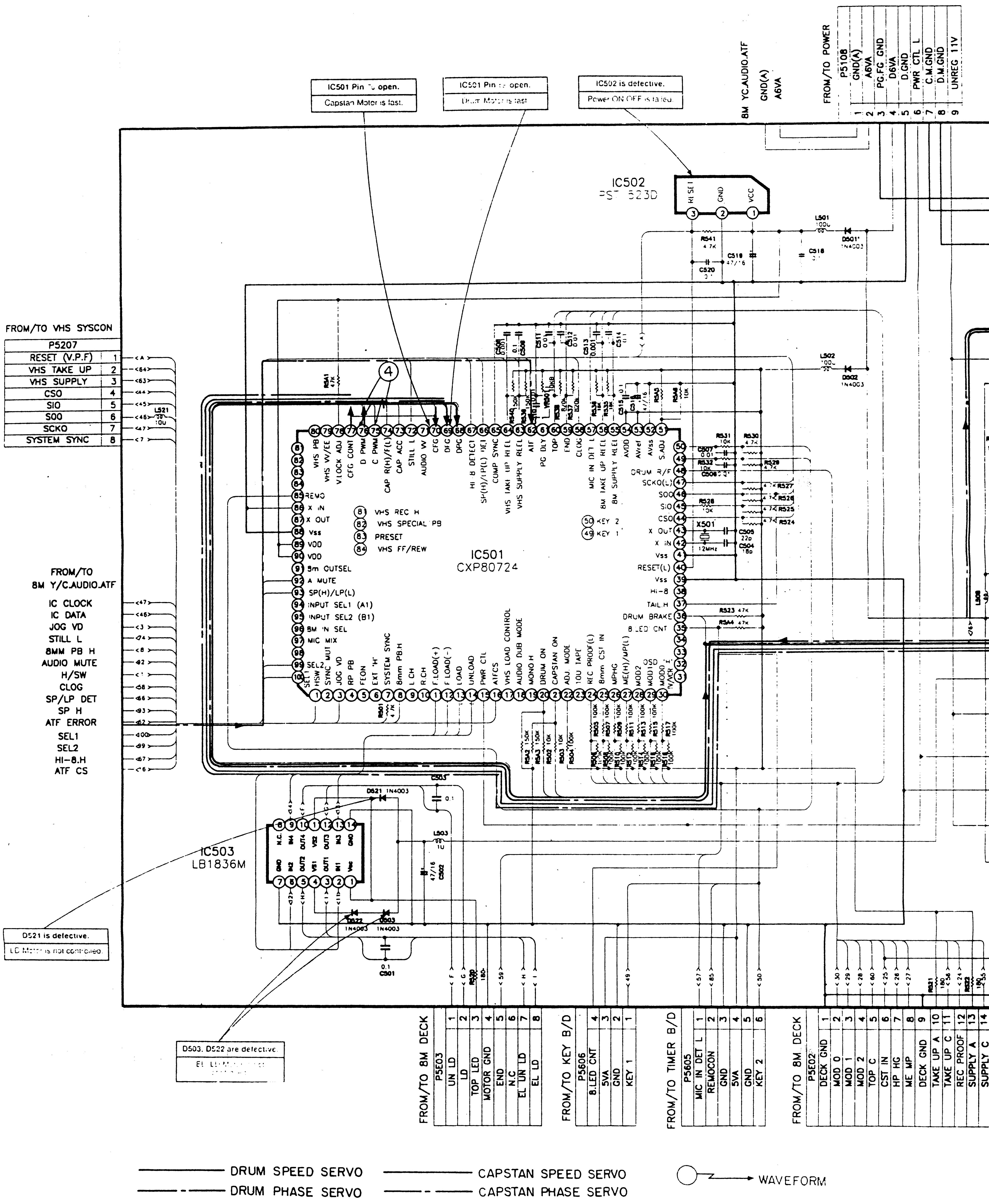
A
B
C
D
E
F
G
H

2. 8mm Circuit Diagrams

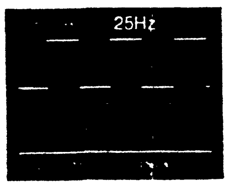
2-1. Main System (Servo, Syscon) Circuit Diagram

• 8mm Main Syste

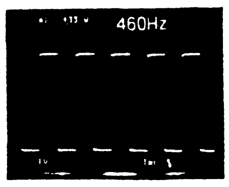
Waveform


IC501 Pin 76 open.
Capstan Motor is fast.
IC501 Pin 69 open.
Drum Motor is fast
IC502 is defective.
Power ON OFF is failed.
IC502
PST 523D
RESET
GND
VCC
IC501
CXP80724
IC503
LB1836M
D521 is defective.
LD Motor is not controlled.
D503. D522 are defective.
FROM/TO VHS SYSCON
P5207
RESET (V.P.F)
VHS TAKE UP
VHS SUPPLY
CSO
SIO
SOO
SCKO
SYSTEM SYNC
FROM/TO 8M Y/C.AUDIO.ATF
IC CLOCK
IC DATA
JOG VD
STILL L
8MM PB H
AUDIO MUTE
H/SW
CLOG
SP/LP DET
SP H
ATF ERROR
SEL1
SEL2
HI-8.H
ATF CS
8M YC.AUDIO.ATF
GND(A)
A6VA
FROM/TO POWER
P5108
GND(A)
A6VA
PG.FG GND
D6VA
D.GND
PWR CTL L
C.M.GND
D.M.GND
UNREG 11V
FROM/TO 8M DECK
P5E03
UN LD
LD
TOP LED
MOTOR GND
END
N.C
EL UN LD
EL LD
FROM/TO KEY B/D
P5606
8.LED CNT
5VA
GND
KEY 1
FROM/TO TIMER B/D
P5605
MIC IN DET L
REMOCON
GND
5VA
GND
KEY 2
FROM/TO 8M DECK
P5E02
DECK GND
MOD 0
MOD 1
MOD 2
TOP C
CST IN
HP HG
ME MP
DECK GND
TAKE UP A
TAKE UP C
REC PROOF
SUPPLY A
SUPPLY C
DRUM SPEED SERVO
DRUM PHASE SERVO
CAPSTAN SPEED SERVO
CAPSTAN PHASE SERVO
WAVEFORM

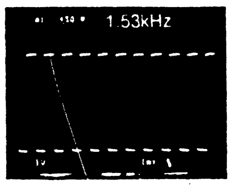
• 8mm Main System Waveform

①


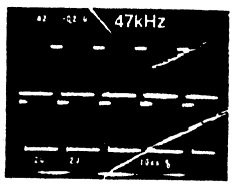
(UP) HSW
(DOWN) DPG
IC506 ⑨

②


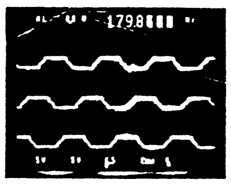
DFG
IC506 ⑩

③


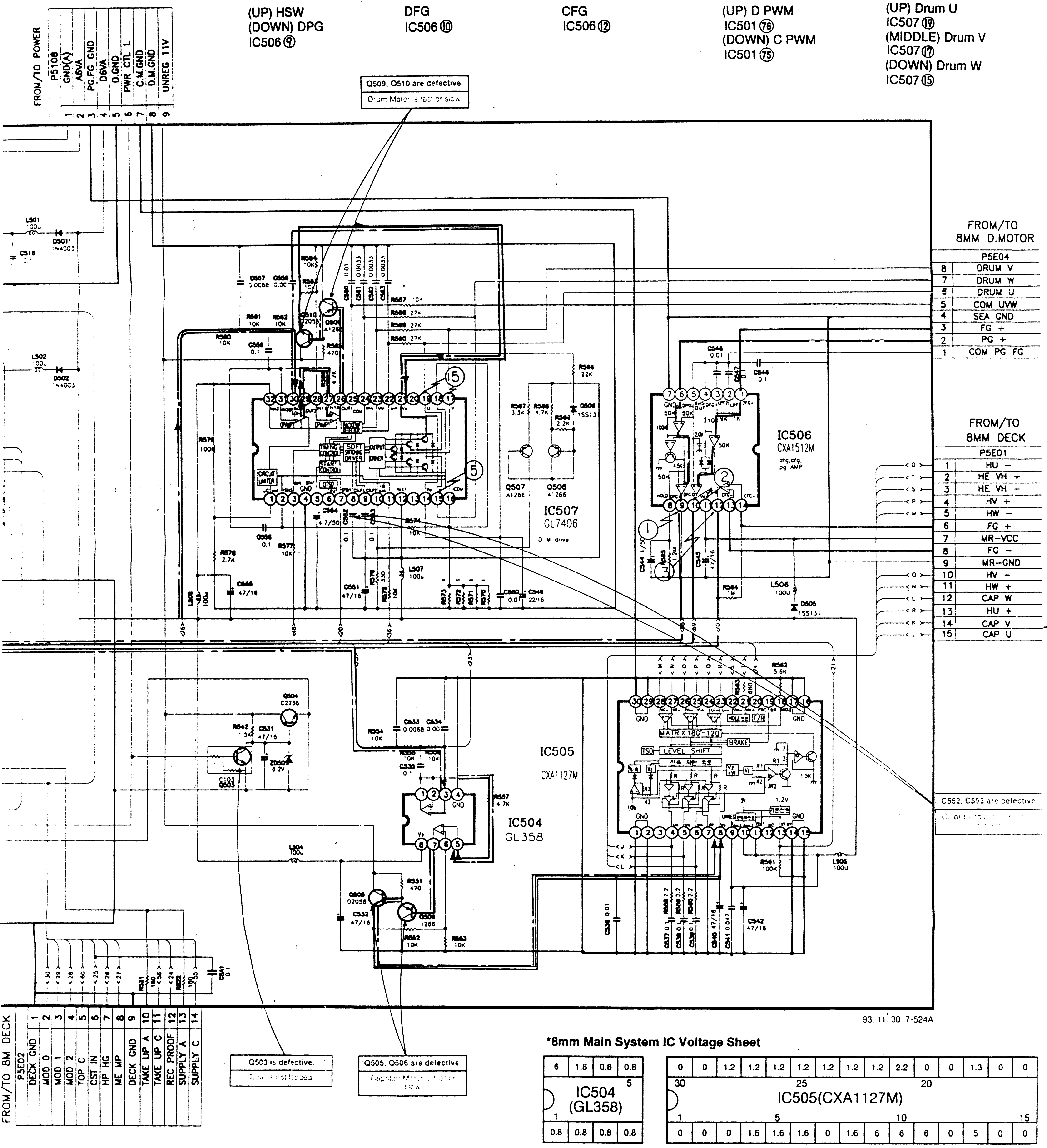
CFG
IC506 ⑫

④


(UP) D PWM
IC501 (76)
(DOWN) C PWM
IC501 (75)

⑤


(UP) Drum U
IC507 ⑲
(MIDDLE) Drum V
IC507 ⑰
(DOWN) Drum W
IC507 ⑮


FROM/TO POWER
P5108
GND(A)
A6VA
PG.FG GND
D6VA
D.GND
PWR CTL L
C.M.GND
D.M.GND
UNREG 11V
L501
D501
L502
D502
IC507
GL7406
D.M drive
Q507
Q508
Q509
Q510
IC506
CXA1512M
dfg,cfg,pg AMP
IC505
CXA1127M
MATRIX 180°-120°
LEVEL SHIFT
BRAKE
IC504
GL358
Q503
Q504
Q505
Q506
FROM/TO 8MM D.MOTOR
P5E04
8 DRUM V
7 DRUM W
6 DRUM U
5 COM UVW
4 SEA GND
3 FG +
2 PG +
1 COM PG FG
FROM/TO 8MM DECK
P5E01
1 HU −
2 HE VH +
3 HE VH −
4 HV +
5 HW −
6 FG +
7 MR-VCC
8 FG −
9 MR-GND
10 HV −
11 HW +
12 CAP W
13 HU +
14 CAP V
15 CAP U
FROM/TO 8M DECK
P5E02
1 DECK GND
2 MOD 0
3 MOD 1
4 MOD 2
5 TOP C
6 CST IN
7 HP HG
8 ME MP
9 DECK GND
10 TAKE UP A
11 TAKE UP C
12 REC PROOF
13 SUPPLY A
14 SUPPLY C

Q509, Q510 are defective.
Drum Motor is fast or slow

C552, C553 are defective
[illegible]

Q503 is defective.
Tape is not loaded.

Q505, Q506 are defective
Capstan Motor is fast or slow

93. 11. 30. 7-524A

*8mm Main System IC Voltage Sheet

IC504 (GL358)

6	1.8	0.8	0.8
			5
1			
0.8	0.8	0.8	0.8

IC505(CXA1127M)

0	0	1.2	1.2	1.2	1.2	1.2	1.2	1.2	2.2	0	0	1.3	0	0
30					25					20				
1				5					10					15
0	0	0	1.6	1.6	1.6	0	1.6	6	6	6	0	5	0	0

IC506(CXA1512M)

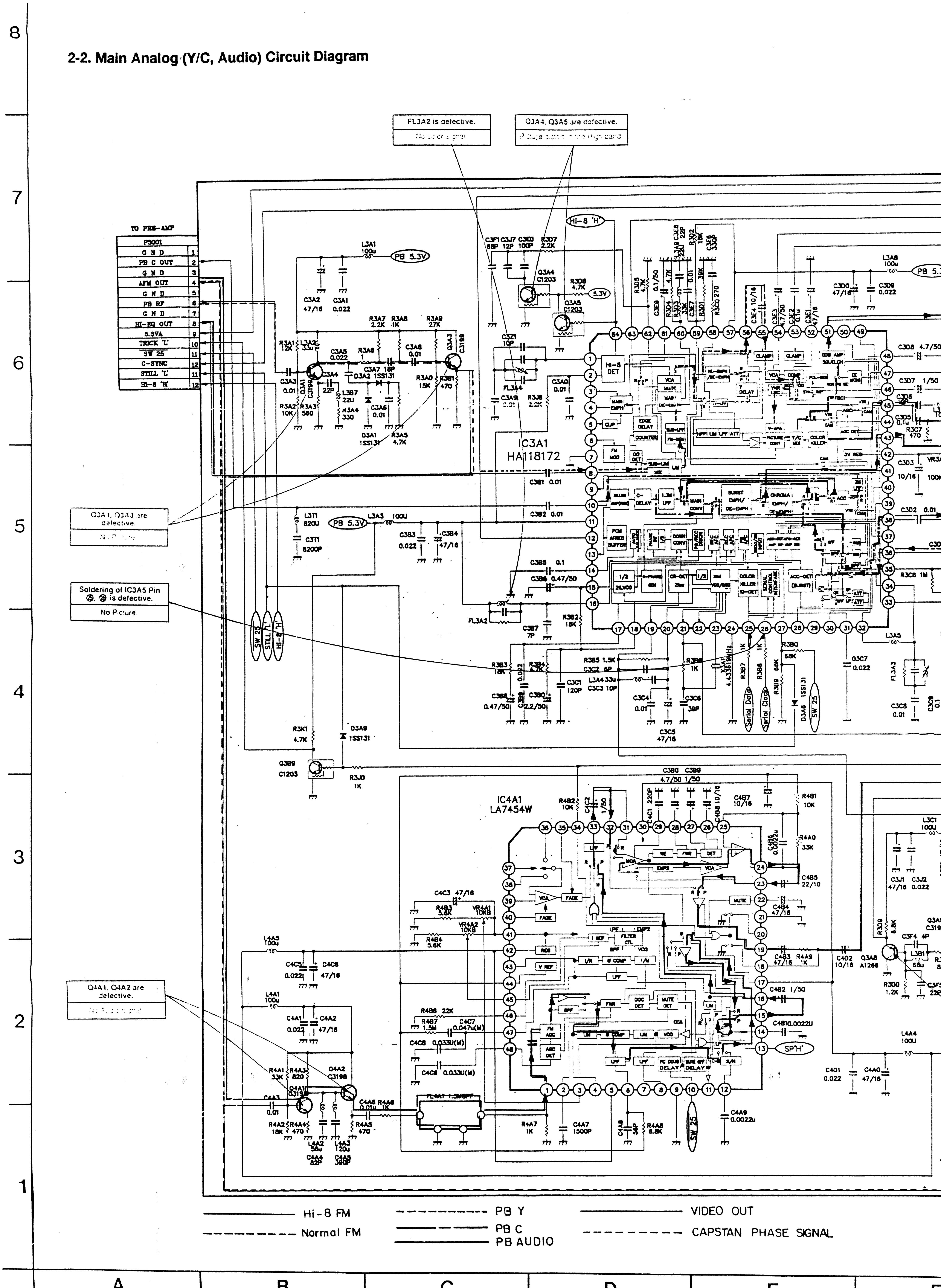
2.2	2.2	5	5.3	5	5	2
14				10		
1				5		
2	2	2	2	2	2	0

IC507(GL7406)

6	1.2	1.2	1.2	1.2	1.2	1.2	1.2	2.2	2.2	2.2	2.2	0	2.2	0	2.2
		30					25					20			
1				5					10					15	
0.1	0	0	0	0	0	3.5	5.5	5.5	0	0	6	0	2.2	2.2	0

FORM

2-2. Main Analog (Y/C, Audio) Circuit Diagram


FL3A2 is defective.
No color signal

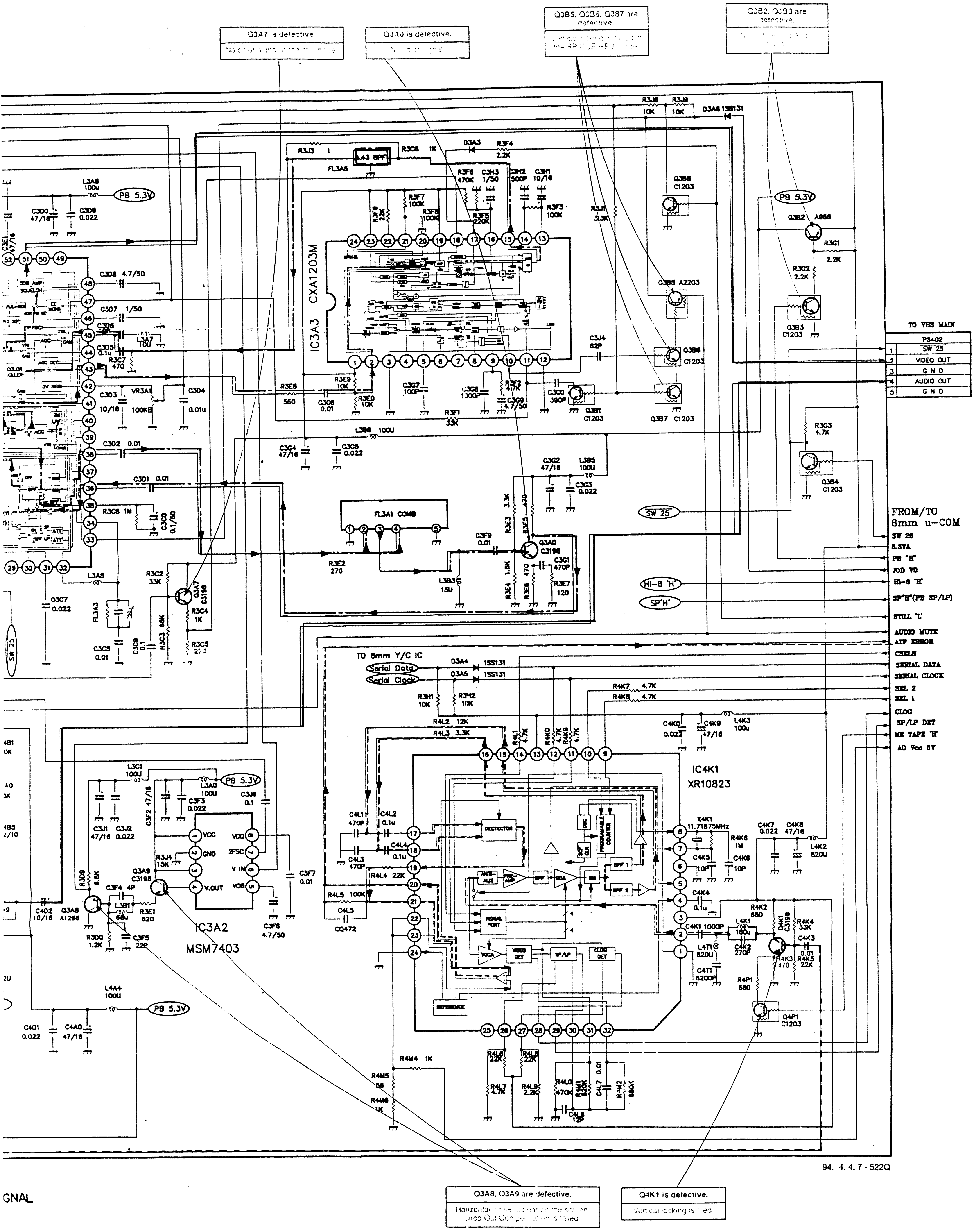
Q3A4, Q3A5 are defective.
Picture distortion in the high band

Q3A1, Q3A3 are defective.
No Picture

Soldering of IC3A5 Pin ㉕, ㉖ is defective.
No Picture.

Q4A1, Q4A2 are defective.
No Audio signal

8
7
6
5
4
3
2
1
A
B
C
D
E
F
TO PRE-AMP
P3001
1 GND
2 PB C OUT
3 GND
4 AFM OUT
5 GND
6 PB RF
7 GND
8 HI-EQ OUT
9 5.3VA
10 TRICK 'L'
11 SW 25
12 C-SYNC
11 STILL 'L'
12 HI-8 'H'
PB 5.3V
HI-8 'H'
5.3V
IC3A1
HA118172
IC4A1
LA7454W
Q3A1 C3198
Q3A3 C3199
Q3A4 C1203
Q3A5 C1203
Q3B9 C1203
Q3A8 A1266
Q4A1 C3198
Q4A2 C3198
FL3A2
FL3A3
FL3A4
FL4A1 1.5MBPF
X3A1 4.433619MHz
Serial Data
Serial Clock
SW 25
STILL 'L'
HI-8 'H'
SP'H'
HI-8 DET
CLAMP
VCA
MAIN DEMPH
EDGE DELAY
COUNTER
CLIP
FM MOD
DO DET
SUB-LIM
MIX
KILLER AMP
C-DELAY
BURST DEMPH/DE-EMPH
CHROMA DEMPH/DE-EMPH
MAIN CONV
PCM AFREC BUFFER
DOWN CONV
1/2 25LVCO
COLOR KILLER ID-DET
SERIAL CONTROL INTERFACE
ACC-DET (BURST)
ATT
LPF
BPF
FADE
VCA
I REF
FILTER CTL
V REF
NR
DMP2
MUTE
FM AGC
AGC DET
DOC DET
MUTE DET
PC DOUB DELAY
S/H
Hi-8 FM
Normal FM
PB Y
PB C
PB AUDIO
VIDEO OUT
CAPSTAN PHASE SIGNAL



CXA1203M
IC3A3
FL3A5
FL3A1 COMB
FL3A3
IC3A2
MSM7403
IC4K1
XR10823
X4K1
11.71875MHz
PB 5.3V
SW 25
HI-8 'H'
SP'H'
TO 8mm Y/C IC
Serial Data
Serial Clock
TO VHS MAIN
P3402
SW 25
VIDEO OUT
G N D
AUDIO OUT
G N D
FROM/TO
8mm u-COM
SW 25
5.3VA
PB "H"
JOD VD
HI-8 "H"
SP"H"(PB SP/LP)
STILL "L"
AUDIO MUTE
ATF ERROR
CSELN
SERIAL DATA
SERIAL CLOCK
SEL 2
SEL 1
CLOG
SP/LP DET
ME TAPE "H"
AD Vcc 5V
DETECTOR
PROGRAMMABLE COUNTER
ANTI-ALIAS
PRE-AMP
BPF
VCA
BPF 1
BPF 2
SERIAL PORT
VIDEO DET
SP/LP
CLOG DET
REFERENCE
VCC
GND
VCC
2FSC
V IN
V.OUT
VOB
Q3A0 C3198
Q3A7 C3198
Q3A8 A1266
Q3A9 C3198
Q3B1 C1203
Q3B2 A966
Q3B3 C1203
Q3B4 C1203
Q3B5 A2203
Q3B6 C1203
Q3B7 C1203
Q3B8 C1203
Q4K1 C3198
Q4P1 C1203
D3A3
D3A4 1SS131
D3A5 1SS131
D3A6 1SS131
F
G
H
I
J
K

Q3A7 is defective

No colour signal in the [illegible] mode

Q3A0 is defective.

No color signal

Q3B5, Q3B6, Q3B7 are defective.

[illegible] in the SP CUE REV mode

Q3B2, Q3B3 are defective.

[illegible]

Q3A8, Q3A9 are defective.

Horizontal noise appear on the screen
Drop Out Compensation is failed

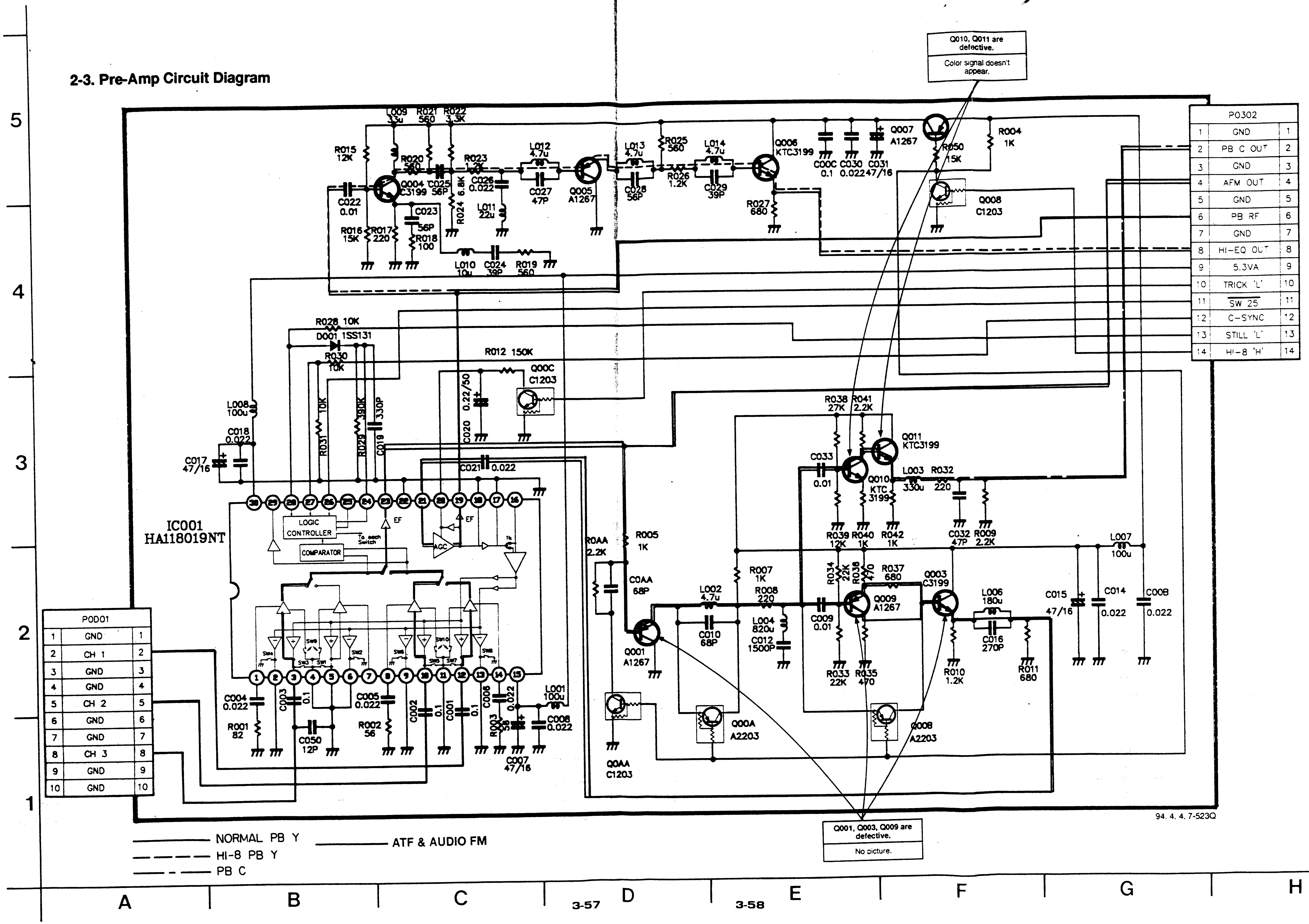
Q4K1 is defective.

Vertical locking is failed.

94. 4. 4. 7 - 522Q

GNAL

2-3. Pre-Amp Circuit Diagram


5
4
3
2
1
A
B
C
D
E
F
G
H
L009 33u
R021 560
R022 3.3K
R015 12K
R020 560
C025 56P
R023 1.2K
C026 0.022
L012 4.7u
C027 47P
Q005 A1267
L013 4.7u
C028 56P
R025 560
R026 1.2K
L014 4.7u
C029 39P
Q006 KTC3199
R027 680
C00C 0.1
C030 0.022
C031 47/16
Q007 A1267
R050 15K
R004 1K
Q008 C1203
C022 0.01
Q004 C3199
C023 56P
R024 6.8K
L011 22u
R016 15K
R017 220
R018 100
L010 10u
C024 39P
R019 560
R028 10K
D001 1SS131
R030 10K
R012 150K
Q00C C1203
L008 100u
C018 0.022
C017 47/16
R031 10K
R029 180K
C019 330P
C020 0.22/50
C021 0.022
IC001
HA118019NT
LOGIC CONTROLLER
COMPARATOR
To each Switch
AGC
EF
1k
R0AA 2.2K
R005 1K
C0AA 68P
Q001 A1267
Q0AA C1203
L002 4.7u
C010 68P
R007 1K
R008 220
L004 820u
C012 1500P
Q00A A2203
R038 27K
R041 2.2K
Q011 KTC3199
C033 0.01
Q010 KTC 3199
L003 330u
R032 220
R039 12K
R040 1K
R042 1K
C032 47P
R009 2.2K
L007 100u
R034 22K
R036 470
R037 680
Q003 C3199
C009 0.01
Q009 A1267
L006 180u
C016 270P
C015 47/16
C014 0.022
C00B 0.022
R033 22K
R035 470
R010 1.2K
R011 680
Q00B A2203
C004 0.022
C003 0.1
R001 82
C050 12P
C005 0.022
R002 56
C002 0.1
C001 0.1
C006 0.022
R003 56
C007 47/16
L001 100u
C008 0.022
P0302
1 GND 1
2 PB C OUT 2
3 GND 3
4 AFM OUT 4
5 GND 5
6 PB RF 6
7 GND 7
8 HI-EQ OUT 8
9 5.3VA 9
10 TRICK 'L' 10
11 SW 25 11
12 C-SYNC 12
13 STILL 'L' 13
14 HI-8 'H' 14
P0D01
1 GND 1
2 CH 1 2
3 GND 3
4 GND 4
5 CH 2 5
6 GND 6
7 GND 7
8 CH 3 8
9 GND 9
10 GND 10
NORMAL PB Y
HI-8 PB Y
PB C
ATF & AUDIO FM
94. 4. 4. 7-523Q

Q010, Q011 are defective.

Color signal doesn't appear.

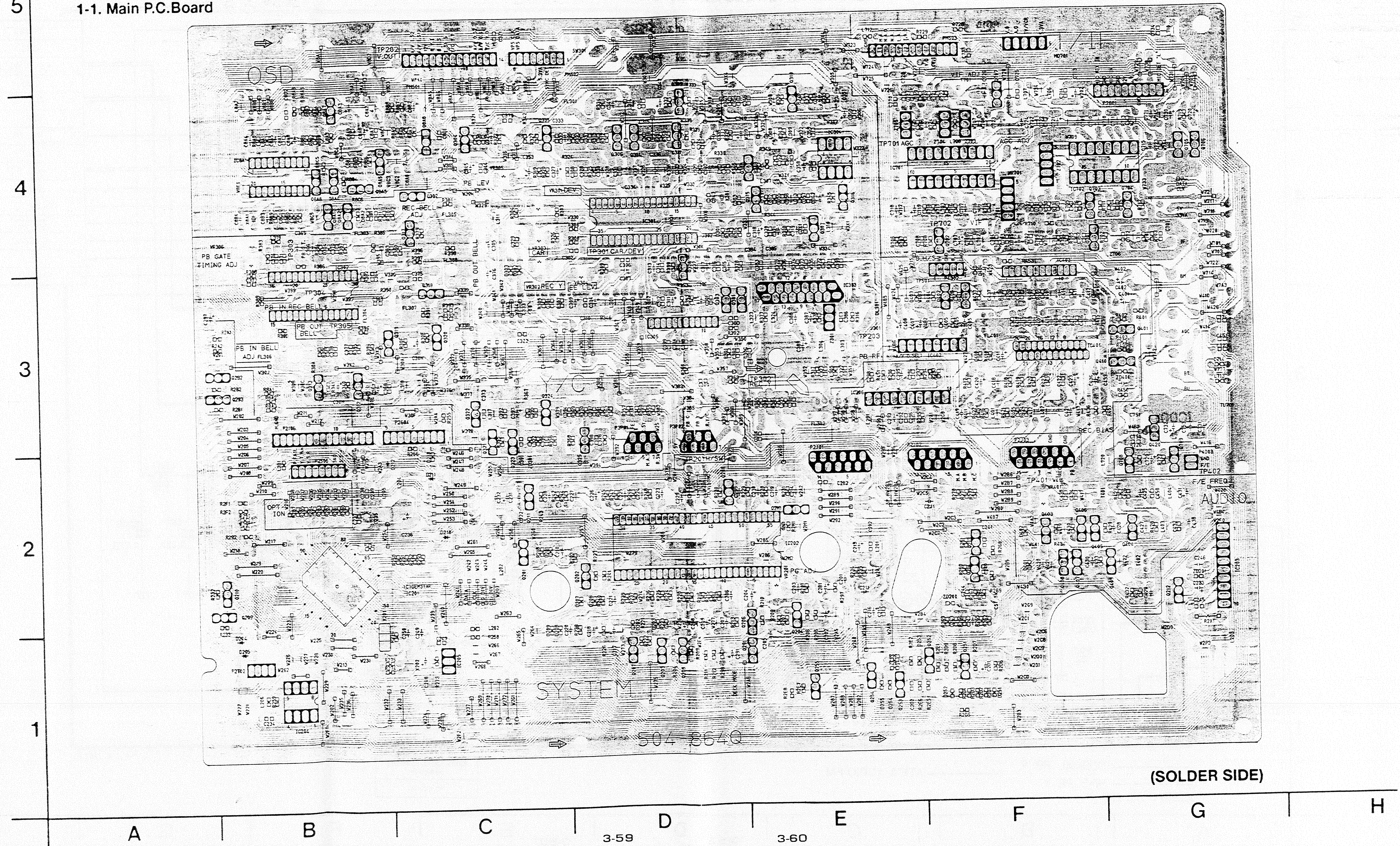
Q001, Q003, Q009 are defective.

No picture.

PRINTED CIRCUIT BOARD DIAGRAMS

1. VHS Printed Circuit Board

1-1. Main P.C.Board


5
4
3
2
1
A
B
C
D
E
F
G
H
OSD
Y/C
SYSTEM
AUDIO
504 864Q
TP202 V.OUT
PB LEV
REC BELL ADJ
PB GATE TIMING ADJ
PB IN REC BELL
PB OUT BELL
PB IN BELL ADJ
TP301 CAR/DEV
TP701 AGC
AGC ADJ
TP702 VIF
TP203
TP201 H/SW
PB RF
REC BIAS
TP401
F/E FREQ
TP402
PG ADJ
VIF ADJ

(SOLDER SIDE)

5

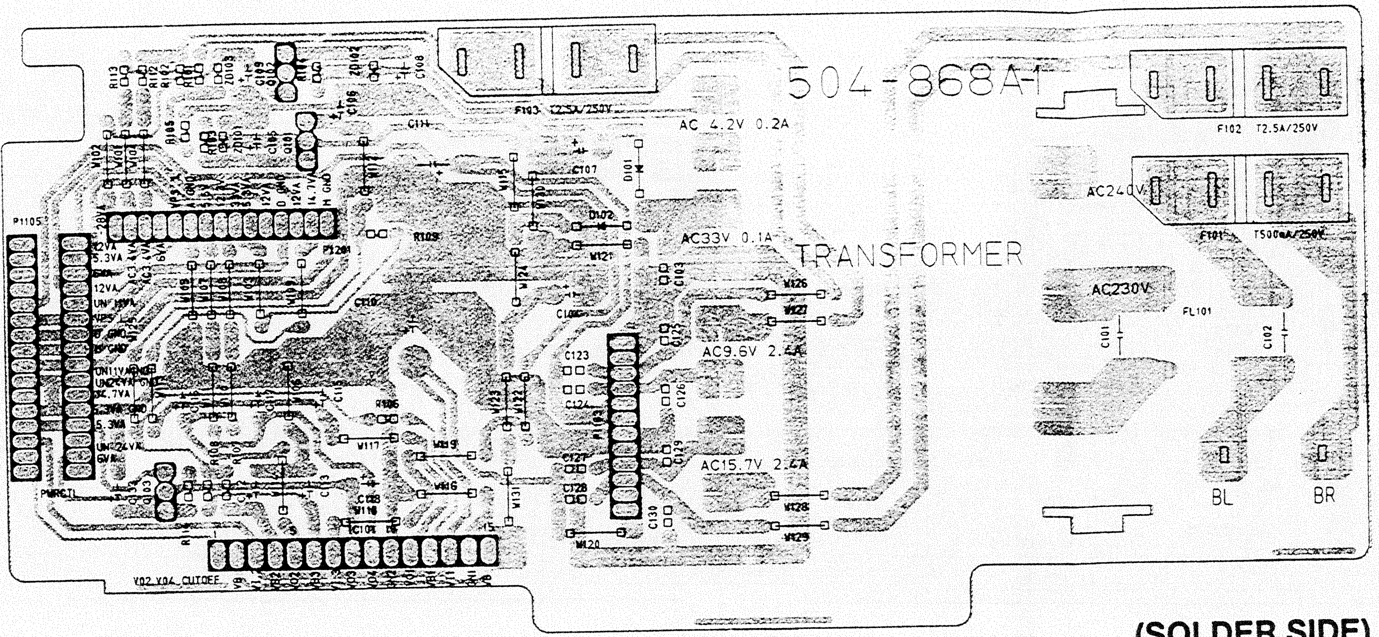
4

3

2

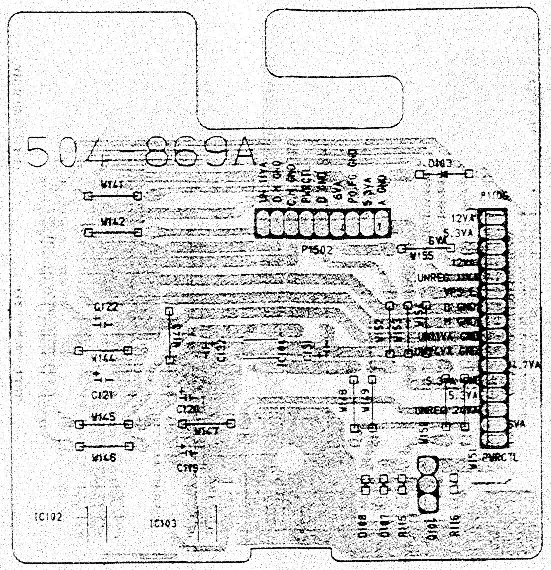
1

1-2. Power 1 P.C.Board


504-868A1
F103 T2.5A/250V
AC 4.2V 0.2A
F102 T2.5A/250V
AC240V
F101 T500mA/250V
AC33V 0.1A
TRANSFORMER
AC230V
FL101
AC9.6V 2.4A
AC15.7V 2.4A
BL
BR
PWRCTL

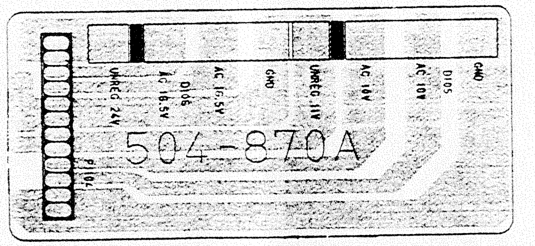
(SOLDER SIDE)

1-3. Power 2 P.C.Board


504-869A
P1502
PWRCTL

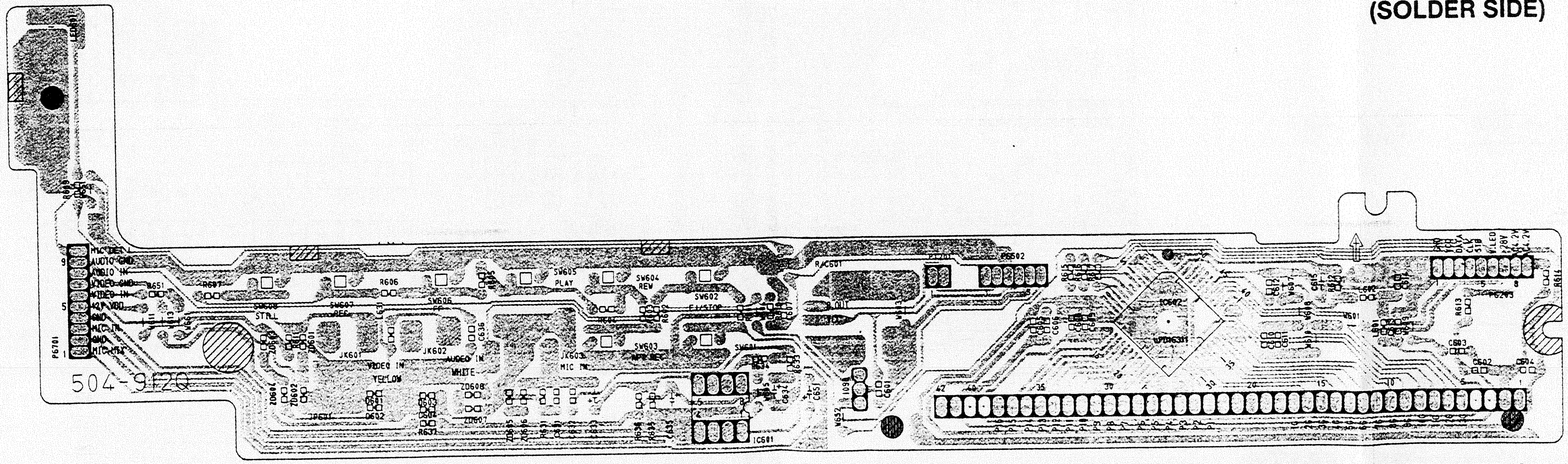
(SOLDER SIDE)

1-4. Power 3 P.C.Board


UNREG 24V
AC 16.5V
AC 11.5V
GND
UNREG 11V
AC 14V
AC 10V
GND
504-870A

(SOLDER SIDE)

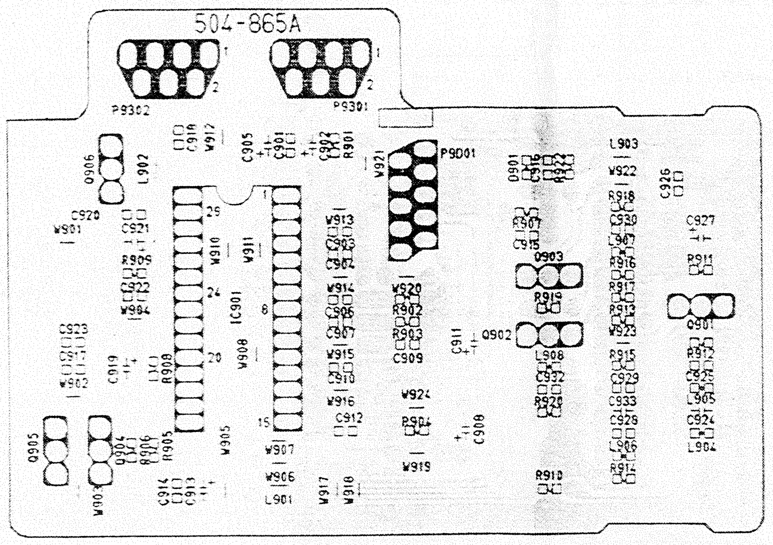
1-5. Timer (I) P.C.Board


P6701
504-912O
SW608 STILL
SW607 REC
SW606
SW605 PLAY
SW604 REW
SW602
SW603
JK601 VIDEO IN YELLOW
JK602 AUDIO IN WHITE
JK603 MIC IN
P6502
IC602
P6243

(SOLDER SIDE)

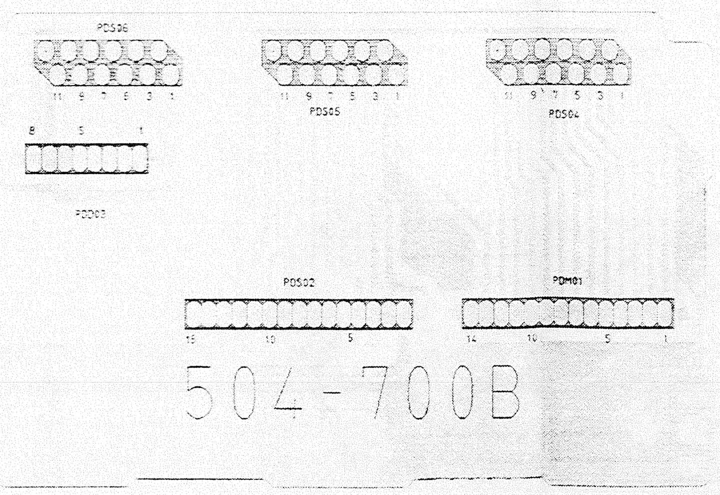
A B C D E F G

1-6. Pre-Amp P.C.Board


504-865A
P9302
P9301
P9D01

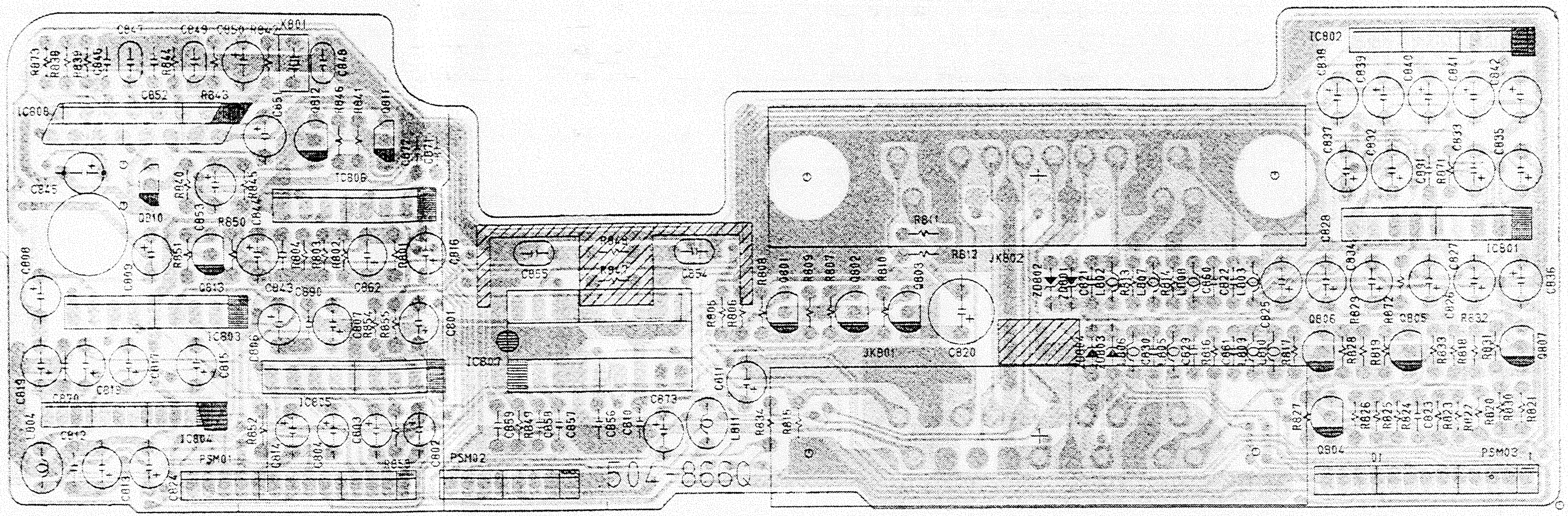
(SOLDER SIDE)

1-7. Deck Junction P.C.Board

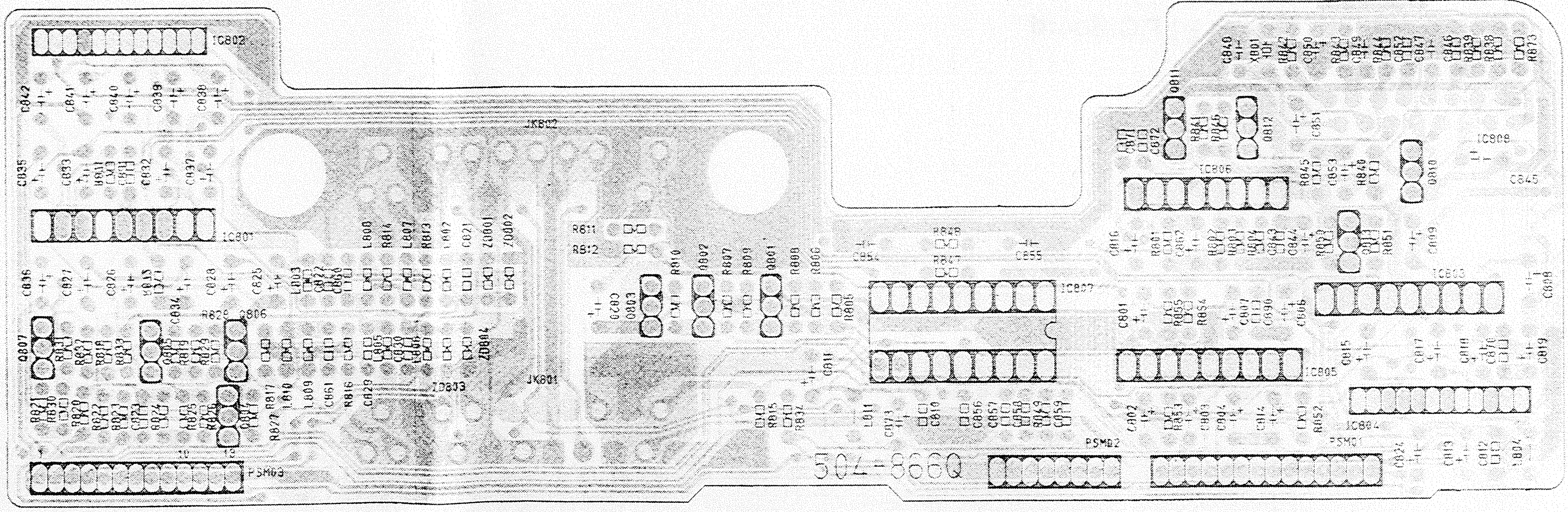

PDS06
PDS05
PDS04
PDD03
PDS02
PDM01
504-700B

(SOLDER SIDE)

1-8. Scart In/Out P.C.Board


504-866Q
IC802
IC808
IC806
IC803
IC805
IC804
IC807
IC801
JKB01
JKB02
PSM01
PSM02
PSM03

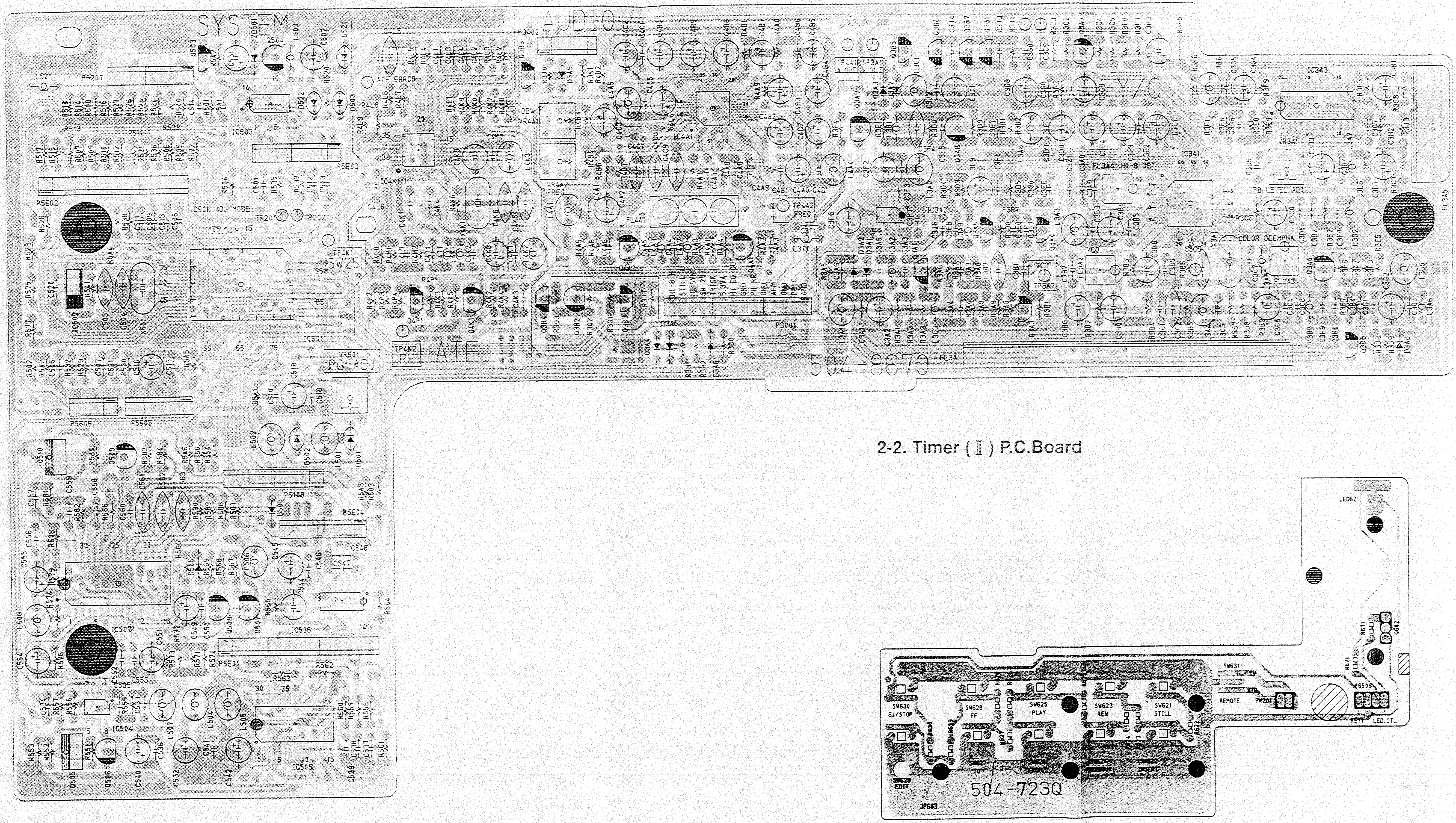
(PARTS SIDE)


504-866Q
IC802
IC801
IC808
IC806
IC807
IC813
IC805
IC804
JK802
JK801
PSM01
PSM02
PSM03

(SOLDER SIDE)

2. 8mm Printed Circuit Board

2-1. Main P.C.Board


SYSTEM
AUDIO
Y/C
DECK ADJ. MODE
PG ADJ
ATF ERROR
PB LEVEL ADJ
COLOR DEEMPHA
504-8670
LED621
SW630 EJ/STOP
SW628 FF
SW625 PLAY
SW623 REW
SW621 STILL
SW631
REMOTE
LED.CTL
EDIT
504-723Q

2-2. Timer (Ⅱ) P.C.Board

(PARTS SIDE)

(SOLDER SIDE)

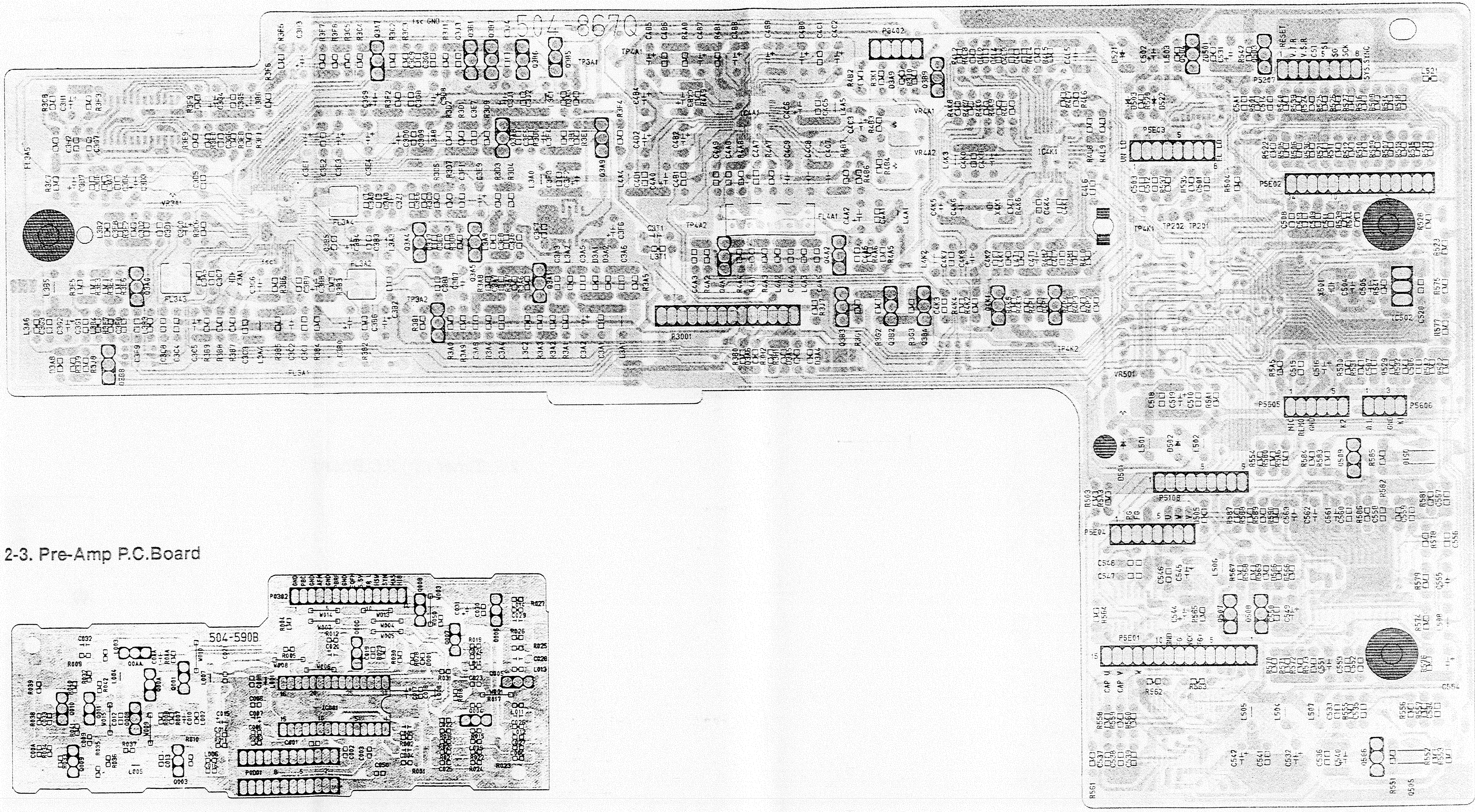
5
4
3
2
1

A B C D E F G

5

Main P.C.Board

4


504-867Q
P3001
P8402
P5E03
P5E02
P5207
P5505
P5606
P5108
P5E04
P5E01
VR501

3

2-3. Pre-Amp P.C.Board

2

504-590B

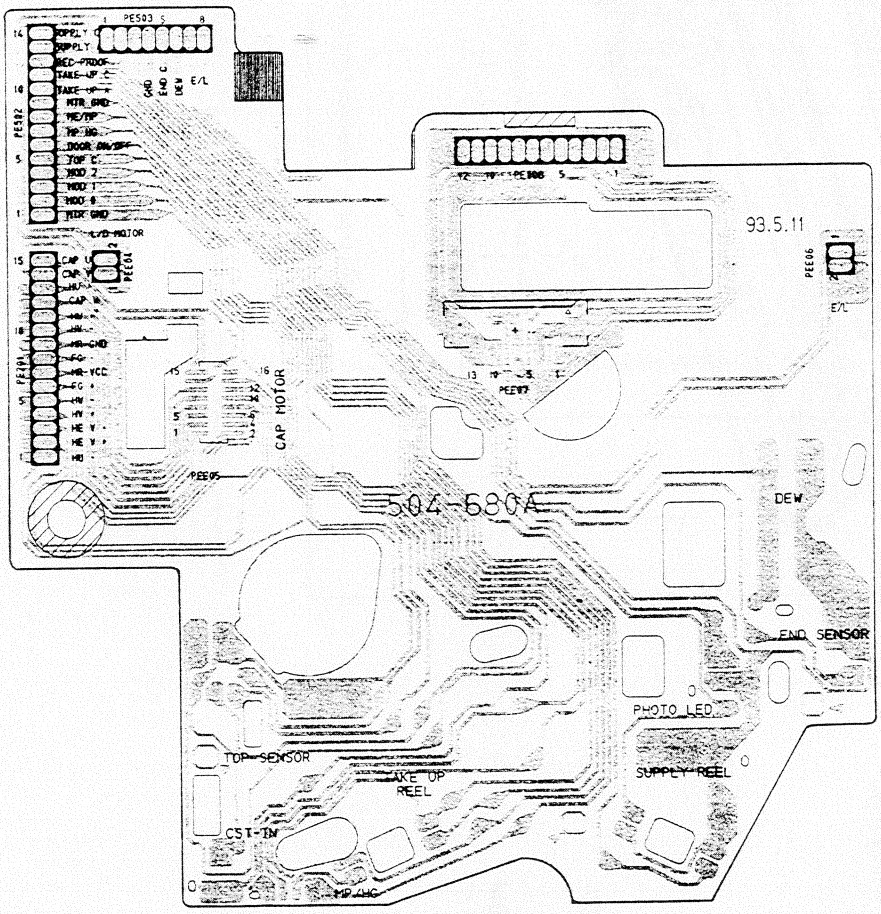
1

(SOLDER SIDE)

(SOLDER SIDE)

A B C D E F G H

2-4. Deck Junction P.C.Board


PE503
1
5
8
PE502
14
SUPPLY C
SUPPLY +
REC-PROOF
TAKE-UP C
10
TAKE-UP +
MTR GND
ME/MP
MP HG
DOOR ON/OFF
5
TOP C
MOD 2
MOD 1
MOD 0
1
MTR GND
L/D MOTOR
GND
END C
DEW
E/L
PE504
PE201
15
CAP U
CAP V
HU +
CAP W
HW +
10
HW -
HR-GND
FG -
HR-VCC
FG +
5
HV -
HV +
HE V -
HE V +
1
HU -
15
16
5
1
CAP MOTOR
PEE05
PEE08
12
5
1
93.5.11
PEE06
E/L
13
PEE07
504-680A
DEW
END SENSOR
PHOTO LED
TOP SENSOR
TAKE UP
REEL
SUPPLY REEL
CST-IN
MP/HG

(SOLDER SIDE)

5

4

3

2

1

A

B

C

SECTION 4
MECHANISM

GoldStar

VHS PAL SERVICE MANUAL

CONTENTS

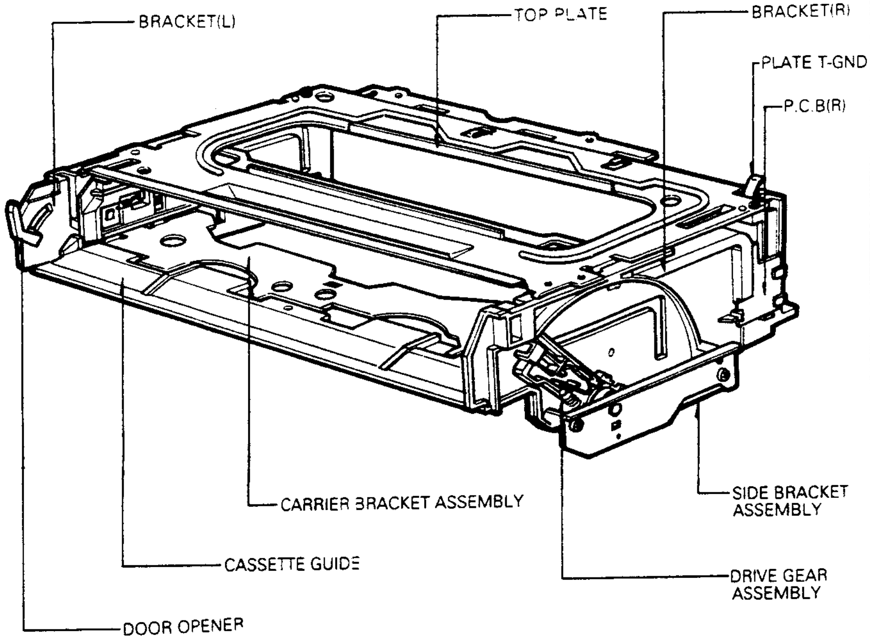
SECTION 4-1
VHS DECK MECHANISM
SECTION 4-2
8mm DECK MECHANISM

GoldStar

SECTION 4-1. VHS DECK MECHANISM

FRONT LOADING MECHANISM DISASSEMBLY

- **Front Loading Mechanism Parts Location**


BRACKET(L)
TOP PLATE
BRACKET(R)
PLATE T-GND
P.C.B(R)
CARRIER BRACKET ASSEMBLY
SIDE BRACKET ASSEMBLY
CASSETTE GUIDE
DRIVE GEAR ASSEMBLY
DOOR OPENER

Front Loading Mechanism Parts Location

1. Component list below will be discribed as if the top and bottom covers and the front panel have already been removed.
2. P.C.B Assembly
3. Top Plate
4. Carrier Bracket Assembly
5. Cassette Guide
6. Side Bracket Assembly
7. Bracket(L), (R)
8. Door Opener
9. Drive Gear Assembly

1. Front Loading Mechanism Assembly (Fig. A-1-1)

1) Remove the Top and Bottom Covers and the Front panel.
2) Unplug the connector.
3) Remove two screws(A).
4) Lift up the Front Loading Mechanism in the direction of arrow(C).

• NOTE

1) When disassembling and reassembling

① Give special attention to removal and to reassemble, because two tabs(D) are engaged.

② Make sure that Bosses of Bracket(L),(R) are properly engaged in the holes of the chassis.

③ To reassemble Front Loading Mechanism, the Drive Gear Assembly should be turned in a counterclockwise as shown in Fig. A-1-2 so that the Rack Gear N.D of Front Loading Mechanism Assembly is meshed into Rack Gear F.L of Deck Mechanism Assembly correctly as shown in Fig. A-1-1.(B).

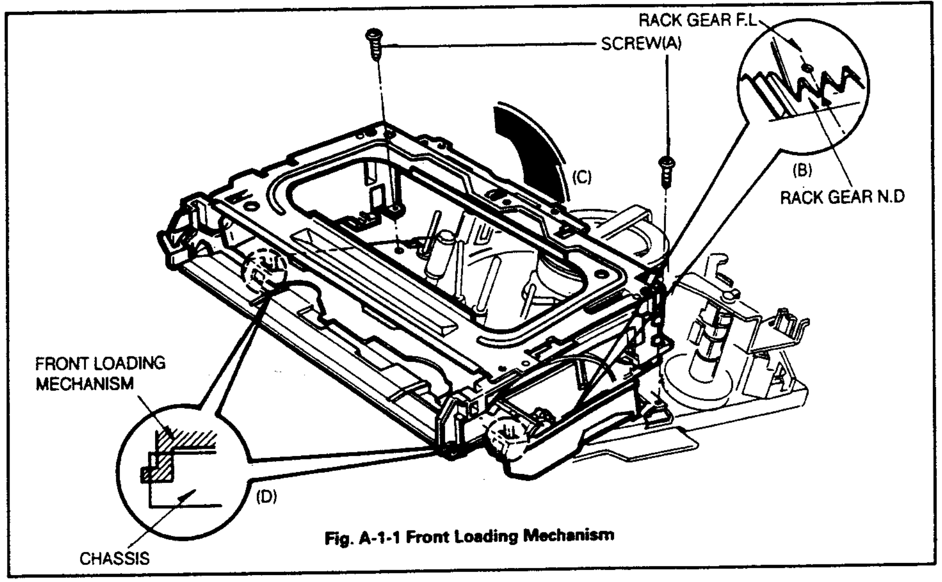
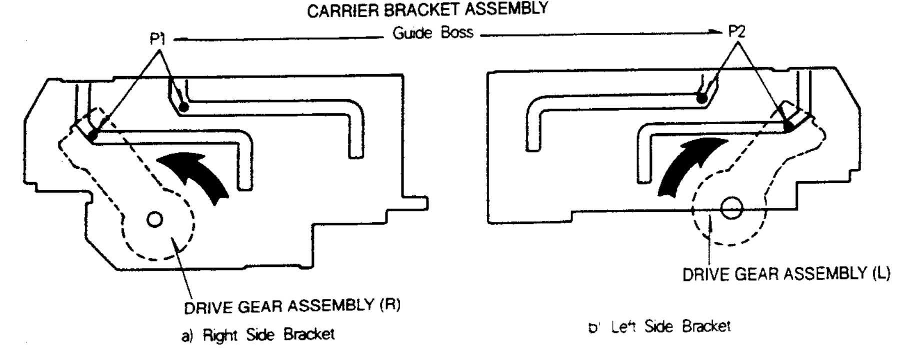

RACK GEAR F.L
SCREW(A)
(C)
(B)
RACK GEAR N.D
FRONT LOADING MECHANISM
(D)
CHASSIS

Fig. A-1-1 Front Loading Mechanism


CARRIER BRACKET ASSEMBLY
P1
Guide Boss
P2
DRIVE GEAR ASSEMBLY (R)
DRIVE GEAR ASSEMBLY (L)

a) Right Side Bracket

b) Left Side Bracket

Fig. A-1-2 Carrier Bracket Assembly

2. PCB(Printed Circuit Board) Assembly

2-1. P.C.B Assembly(R)(Fig. A-2)

1) Remove the PCB Assembly(R) by pushing three Hooks (A) outward.
2) Release the Lead wire from stoppers.

2-2. PCB Assembly(L).(Fig. A-2)

1) Remove the PCB Assembly(L) by pushing the Hook(B) outward.
2) Release the Lead Wire from stoppers.

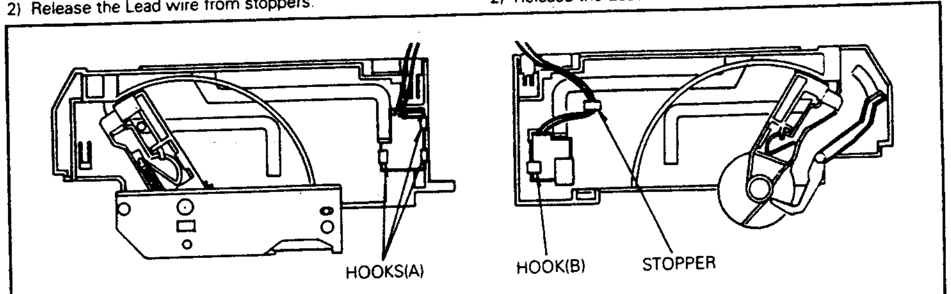

HOOKS(A)
HOOK(B)
STOPPER

Fig. A-2 PCB Assembly

3. Top Plate(Fig. A-3)

1) Remove two screws(A).
2) Push the upper part of Top plate Ground and then lift up the Top Plate in the direction of arrow(B).

• NOTE

1) When reassembling, be certain that the tabs(C) of Top Plate is in both Bracket(L),(R).

① Then align the guide holes(D) of Top Plate with Bosses of side Bracket(L),(R).

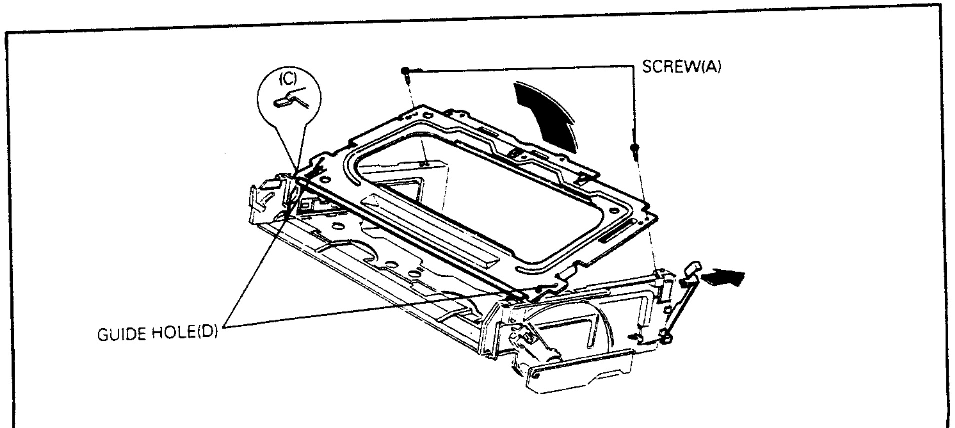

(C)
SCREW(A)
GUIDE HOLE(D)

Fig. A-3 Top Plate

4. Carrier Bracket Assembly

4-1. Carrier Bracket Assembly(Fig. A-4-1)

1) Remove the Carrier Bracket Assembly by moving it in the direction of arrow(C).

• NOTE

1) When reassembling, be sure that parts(A) of Carrier Bracket Assembly are seated in parts(B) of Bracket(L),(R).

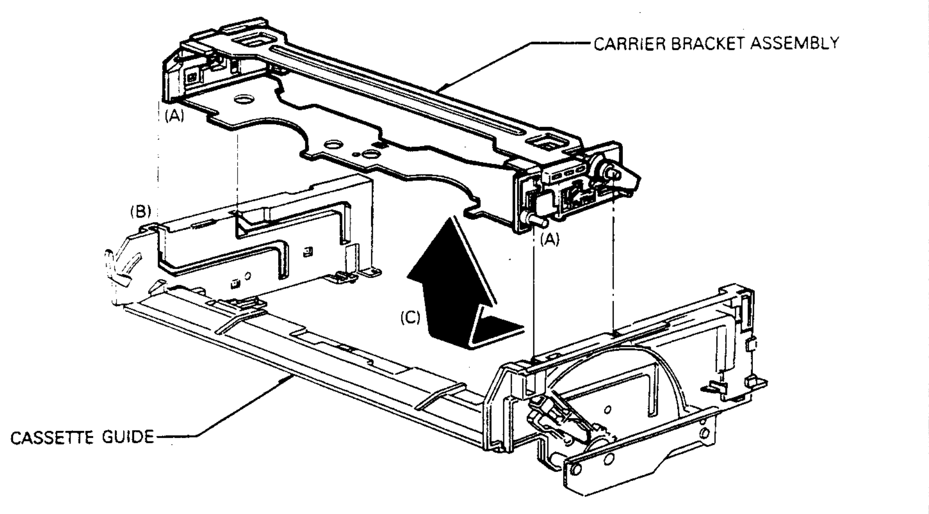

CARRIER BRACKET ASSEMBLY
(A)
(B)
(A)
(C)
CASSETTE GUIDE

Fig. A-4-1 Carrier Bracket Assembly

4-2. Cassette Opener(Fig. A-4-2)

1) Release the spring O.C from the Hook(A) and then release it from Hook(C) of cassette opener.
2) Remove the cassette opener by releasing the Hook(B) from the Holder(R).

4-3. Rid Opener(Fig. A-4-2)

1) Remove the rid opener by pushing it outward.

• NOTE

1) When reassembling, seat the upper part of the rid opener in the grooved of Holder(R) and push it inward.

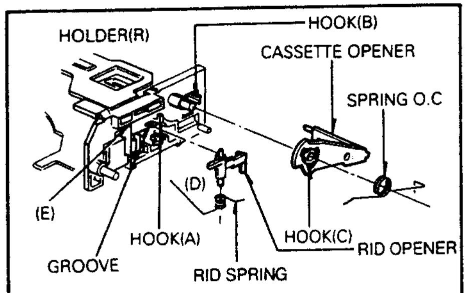

HOLDER(R)
HOOK(B)
CASSETTE OPENER
SPRING O.C
(D)
(E)
HOOK(A)
HOOK(C)
RID OPENER
GROOVE
RID SPRING

Fig. A-4-2 Cassette Door Opener/Rid Opener

4-4. Detect Lever and Detect Spring

1) Remove the spring detect.
2) Lower the side(A) of Detect Lever and then remove the Detect Lever by pushing it outward.

• NOTE

1) When reassembling, make sure that the part(C) of Detect Lever set in the part(B) of Holder(R).

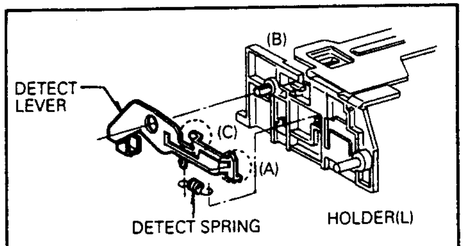

(B)
DETECT LEVER
(C)
(A)
DETECT SPRING
HOLDER(L)

Fig. A-4-3 Detect Lever, Detect Spring

4-5. Support Bracket Assembly(Fig. A-4-4)

1) Take the Support Bracket out by releasing hooks(A),(B)

• NOTE

1) When disassembling and reassembling, be careful because heavy force can damage the hooks.

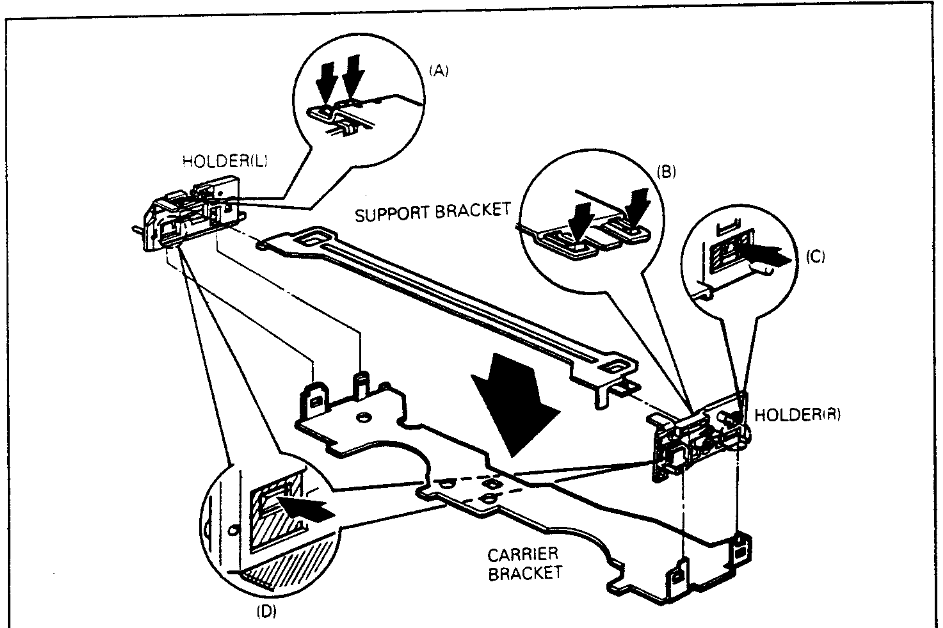

(A)
HOLDER(L)
(B)
SUPPORT BRACKET
(C)
HOLDER(R)
CARRIER BRACKET
(D)

Fig. A-4-4 Support Bracket/Carrier Bracket

4-6. Carrier Bracket Assembly(Fig. A-4-4)

1) Remove the Carrier Bracket by releasing hooks(C),(D).

5. Cassette Guide(Fig. A-5)

1) Remove the Switch Spring with the Front Loading Mechanism Assembly turned over.
2) Push two hooks(B) outward.
3) Remove the Cassette Guide by pushing two hooks(A). outward(if one is removed, the other will be easy to remove)

• NOTE

1) When reassembling

① Seat projections(E) of Cassette Guide in holes of Bracket Assembly(L),(R) and then engage the Hook(A).

② After finishing previous step, fix the Cassette Guide to the Bracket Assembly(L),(R) by pushing two hooks(B) inward.

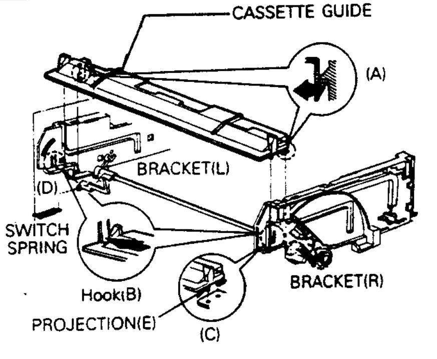

CASSETTE GUIDE
(A)
BRACKET(L)
(D)
SWITCH SPRING
Hook(B)
PROJECTION(E)
(C)
BRACKET(R)

Fig. A-5 Cassette Guide

6. Bracket Assembly Side (Fig. A-6-1)

1) Remove two screws(A) and then remove the Side Bracket Assembly and the Rack Gear N.D.

• NOTE

1) When reassembling

① Turn the Drive Gear Assembly in the direction of arrow (C).

② Reassemble the Rack Gear N.D. to the Side Bracket Assembly, as shown in Fig. A-6-2, and then reassemble it to the Bracket Assembly(L). This time the Assembling Figure should be the same as(B) at the rectangular hole of Bracket Side.

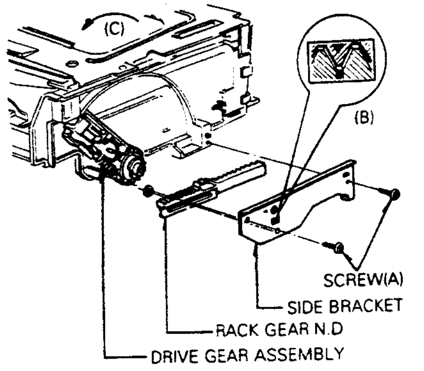

(C)
(B)
SCREW(A)
SIDE BRACKET
RACK GEAR N.D
DRIVE GEAR ASSEMBLY

Fig. A-6-1 Side Bracket Assembly

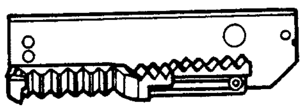


Fig. A-6-2

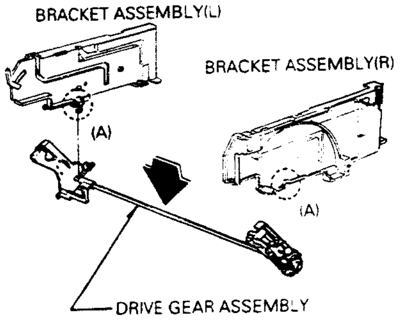

BRACKET ASSEMBLY(L)
BRACKET ASSEMBLY(R)
(A)
(A)
DRIVE GEAR ASSEMBLY

Fig. A-7 Bracket Assembly(L),(R)

7. Bracket Assembly(L),(R)(Fig. A-7)

1) Seperate the Bracket Assembly(L),(R) from the Gear Assembly Drive.

• NOTE

1) When reassembling, seat the shaft in the part(A) of Bracket Assembly(L),(R).

8. Door Opener(Fig. A-8)

1) Remove the Door Opener by pushing Hook(A) outward.

• NOTE

1) When reassembling, seat the part(B) of Door Opener in the hole(⬊) of Bracket(L).

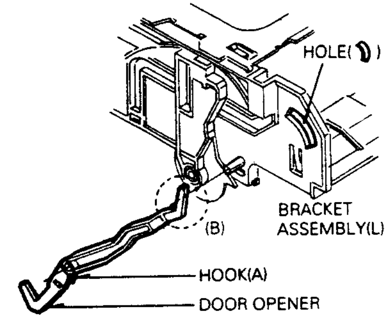

HOLE(⬊)
BRACKET ASSEMBLY(L)
(B)
HOOK(A)
DOOR OPENER

Fig. A-8 Door Opener

9. Drive Gear Assembly

9-1. Drive Gear Assembly(Fig. A-9-1)

1) Remove the Drive Gear Assembly from the Bracket Assembly(L),(R).

9-2. Cushion Spring(Fig. A-9-1)

1) Remove the cushion spring from the Gear R .

9-3. Cap-D(Fig. A-9-1)

1) Remove the Cap-D by lifting it up.

9-4. Spring C.C(Fig. A-9-1)

1) Remove the Spring C.C from the Gear R.

9-5. Gear C(Fig. A-9-1)

1) Remove the Gear C by lifting up when the projection of Gear C is aligned with the hole of Gear R while rotating the Gear C in the counterclockwise direction.

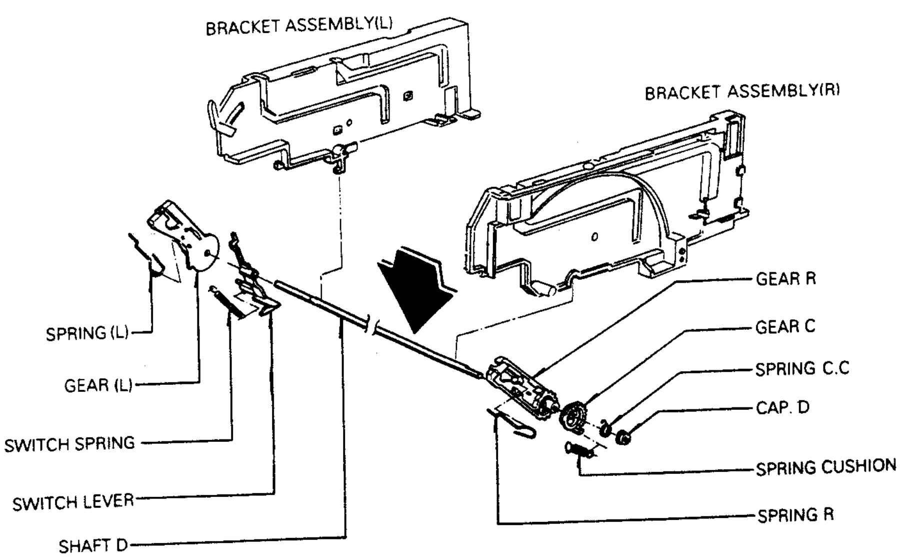

BRACKET ASSEMBLY(L)
BRACKET ASSEMBLY(R)
GEAR R
GEAR C
SPRING C.C
CAP. D
SPRING CUSHION
SPRING R
SPRING (L)
GEAR (L)
SWITCH SPRING
SWITCH LEVER
SHAFT D

Fig. A-9-1 Drive Gear Assembly

• NOTE

1) When reassembling, seat the projections of Gear R in the holes of Gear C when the projection of Gear R is aligned with the hole of Gear C, and then keep the Gear C turned in the clockwise direction.

9-6. Gear R(Fig. A-9-1)

1) Lift up the Gear R from the Shaft.

9-7. Spring R(Fig. A-9-2)

1) Remove the Spring R by releasing Hooks.

• NOTE

1) When reassembling, be certain Spring R in the part(A) of Gear R.

9-8. Gear L.(Fig. A-9-1)

1) Remove the Gear L from the shaft.

9-9. Spring L (Fig. A-9-2)

1) Remove the Spring L by releasing Hooks from the Gear L.

• NOTE: (Refer to the Spring R Section)

9-10. Switch Lever(Fig. A-9-1)

1) Remove the Switch Lever from the shaft.

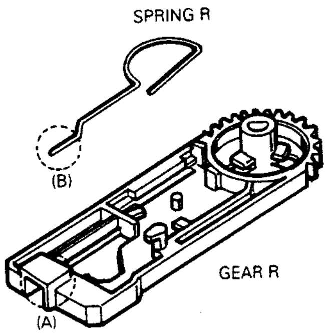
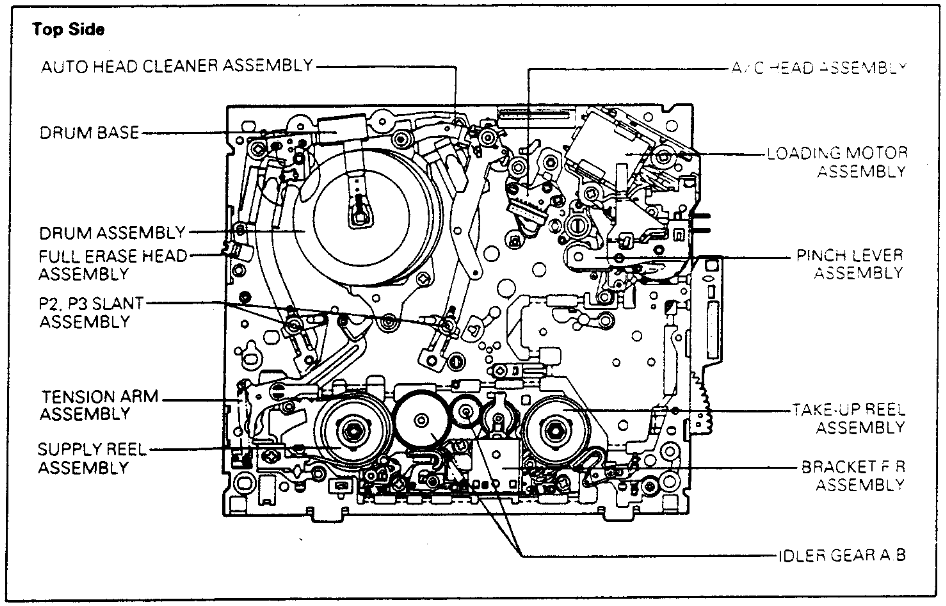
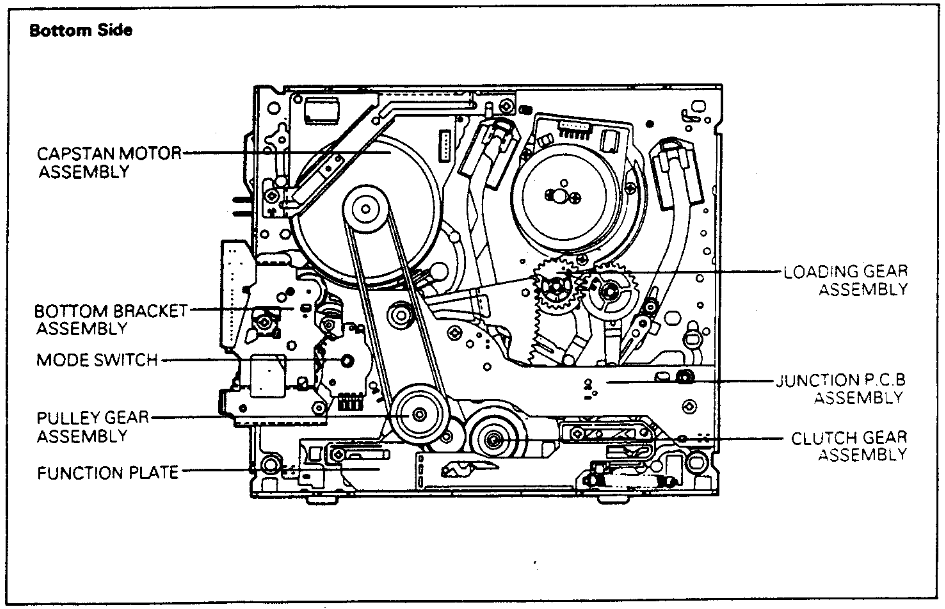

SPRING R
(B)
GEAR R
(A)

Fig. A-9-2 Spring R

DECK MECHANISM DISASSEMBLY

• Deck Mechanism Parts Location


Top Side
AUTO HEAD CLEANER ASSEMBLY
A/C HEAD ASSEMBLY
DRUM BASE
LOADING MOTOR ASSEMBLY
DRUM ASSEMBLY
FULL ERASE HEAD ASSEMBLY
PINCH LEVER ASSEMBLY
P2, P3 SLANT ASSEMBLY
TENSION ARM ASSEMBLY
TAKE-UP REEL ASSEMBLY
SUPPLY REEL ASSEMBLY
BRACKET F.R ASSEMBLY
IDLER GEAR A.B


Bottom Side
CAPSTAN MOTOR ASSEMBLY
LOADING GEAR ASSEMBLY
BOTTOM BRACKET ASSEMBLY
MODE SWITCH
JUNCTION P.C.B ASSEMBLY
PULLEY GEAR ASSEMBLY
CLUTCH GEAR ASSEMBLY
FUNCTION PLATE

1. Auto Head Cleaner Assembly (Fig. B-1) (Optional Item)

1) Remove the Cleaner Arm Assembly (Auto Head Cleaner Assembly) by pushing the Locking Tab.(B) outward.
2) Remove the Cleaner Upper Spring and then remove the Cleaner Upper Arm Sub Assembly.
3) Remove the Cleaner Spring.

• NOTE

1) When reassembling, do not touch the Video Head Tip with fingers or tools.

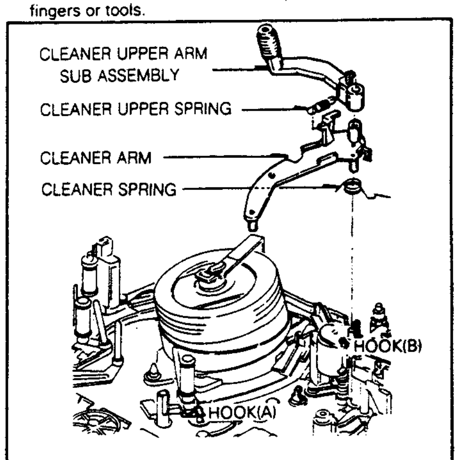

CLEANER UPPER ARM SUB ASSEMBLY
CLEANER UPPER SPRING
CLEANER ARM
CLEANER SPRING
HOOK(B)
HOOK(A)

Fig. B-1 Auto Head Cleaner Assembly

2. Drum Assembly and Drum Base(Fig. B-2)

1) Remove the Auto Head Cleaner Assembly. (Option)
2) Unplug the connector with the Deck Mechanism Assembly turned over.
3) Loosen the screw(A) and then lift up the Drum Brush.
4) Remove two screws(B) and then lift up the Drum Assembly and Drum Base from the Deck Mechanism Assembly.
5) Separate the Drum Assembly from the Drum Base by Loosening three screws(C) on the back of Drum Base.

• NOTE

1) When disassembling and reassembling
① Do not touch the Video Head tip with fingers or tools. (Give special attention to disassembling and reassembling of Auto Head Cleaner Assembly)
② After reinstalling the Drum Brush, the Drum Brush should be aligned with the center of vertical axis of Drum Assembly
③ After completing the reassembly, adjust the transportation system and the Servo P.G.

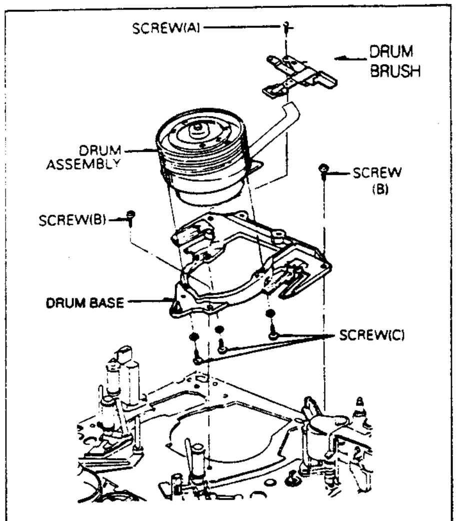

SCREW(A)
DRUM BRUSH
DRUM ASSEMBLY
SCREW (B)
SCREW(B)
DRUM BASE
SCREW(C)

Fig. B-2 Drum Assembly/Drum Base

3. Drum Assembly

3-1. Drum Sub and Motor Assembly (Fig. B-3-1)
: New Type (No two screws and P.C.B on the Drum)

1) Remove the Drum Base from the Deck Mechanism Assembly.
2) Separate the Drum Assembly from the Drum Base.
3) Remove two screws(A) and then remove the rotor.
4) Remove three screws(B) and then remove the stator.

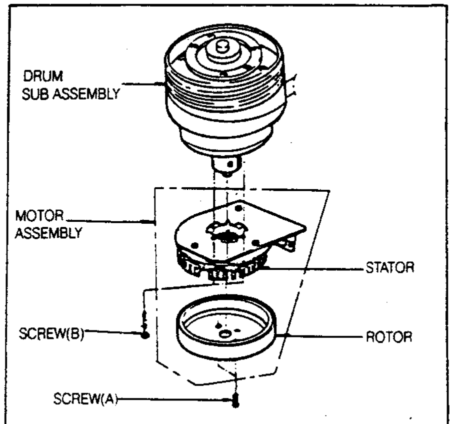

DRUM SUB ASSEMBLY
MOTOR ASSEMBLY
STATOR
SCREW(B)
ROTOR
SCREW(A)

Fig. B-3-1 Drum Sub and Motor Assembly

• NOTE

1) When disassembling and reassembling
① Do not touch the Video Head Tip with fingers or tools.

3-2. Upper and Lower Drum Assembly (Fig. B-3-2)
: Old Type (There are two screws and P.C.B on the Drum)

1) Remove the Drum Assembly and Drum Base from the Deck Mechanism Assembly.
2) Separate the Drum Assembly from the Drum Base.
3) Remove two screws(A).
4) Remove the P.C.B.
5) Separate the upper Drum Assembly from the Lower Drum Assembly.

• NOTE

1) When disassembling and reassembling

① Do not touch the Video Head Tip with fingers or tools.

② Make sure that the color(white) marked on the P.C.B of the upper Drum should coincide with the color(Green) marked on the Flange Assembly.

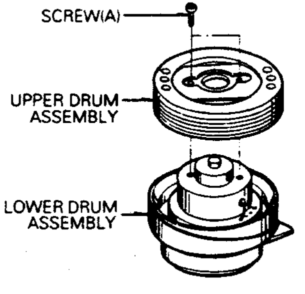

SCREW(A)
UPPER DRUM ASSEMBLY
LOWER DRUM ASSEMBLY

Fig. B-3-2 Upper/Lower Drum Assembly

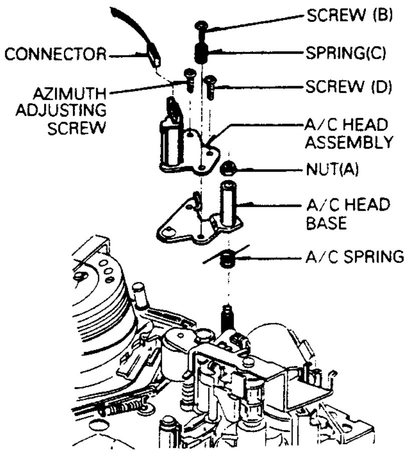

SCREW (B)
CONNECTOR
SPRING(C)
AZIMUTH ADJUSTING SCREW
SCREW (D)
A/C HEAD ASSEMBLY
NUT(A)
A/C HEAD BASE
A/C SPRING

Fig. B-4 A/C Head Assembly

4. A/C(Audio/Control) Head Assembly (Fig.B-4)

1) Unplug the connector
2) Remove the Nut(A), and then lift up the A/C Head Assembly.
3) Remove the Azimuth Adjusting Screw.
4) Remove two screws(B),(D) and then separate the A/C Head Assembly from the Base A/C Head Assembly.

• NOTE

1) When disassembling

① First of all, release the spring A/C.

② Do not touch the A/C Head Tip with fingers or tools.

③ After reinstalling the Audio Control Head Assembly, adjust the Tilt, Azimuth and Height of A/C Head.

5. Pinch Lever Assembly(Fig. B-5)

1) Remove one Nut, and then remove the Dew Bracket.
2) Lift up Pinch Lever Assembly.
3) Remove the Pinch Spring, and remove the Pinch Lever.
4) Remove the Stopper Spring and remove the Pinch Stopper by lifting it up when the Hook of Pinch Stopper is aligned with the hole of Pinch Arm while rotating the Pinch Stopper in the counterclockwise direction.
5) Remove the Pinch Cap, and then remove the Pinch Roller Assembly.

• NOTE

1) When disassembling and reassembling

① Be careful not to get any foreign substance on the Roller.

② When disassembling the Pinch Cap, be careful not to damage the Pinch Arm.

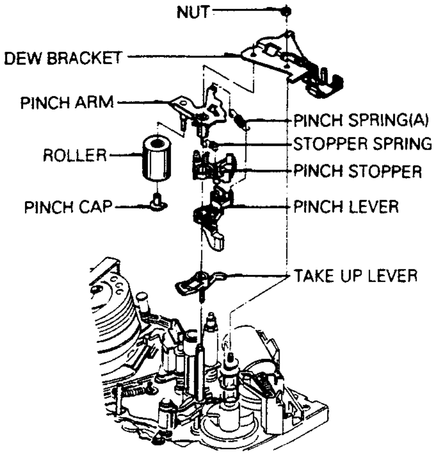

NUT
DEW BRACKET
PINCH ARM
PINCH SPRING(A)
STOPPER SPRING
ROLLER
PINCH STOPPER
PINCH CAP
PINCH LEVER
TAKE UP LEVER

Fig. B-5 Pinch Lever Assembly

6. Loading Motor Assembly(Fig. B-6-1, B-6-2)

1) Remove the Dew Bracket.
2) Unplug the connector from the Junction P.C.B Assembly
3) Remove two screws(A).
4) Remove the worm wheel by pushing it down.
5) Remove the Loading Motor Assembly by pushing(C) and (D) outward.
6) Remove the worm Gear Assembly from the Loading Motor Assembly by pushing it.

• NOTE

1) When reassembling

① Make sure that the worm assembly is seated in the axis of Loading Motor.

② Two grooves(G) of Loading Motor should be turned up and two projections(F) of Bracket Assembly should be seated in each at the two holes(E)(Fig. B-6-1).

③ Take notice of the polarity of the Loading Motor.

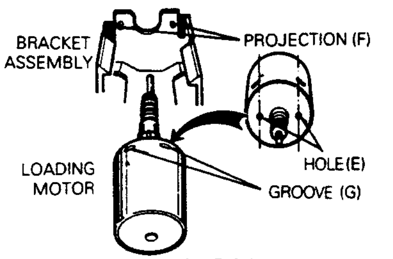

BRACKET ASSEMBLY
PROJECTION (F)
LOADING MOTOR
HOLE (E)
GROOVE (G)

Fig. B-6-1

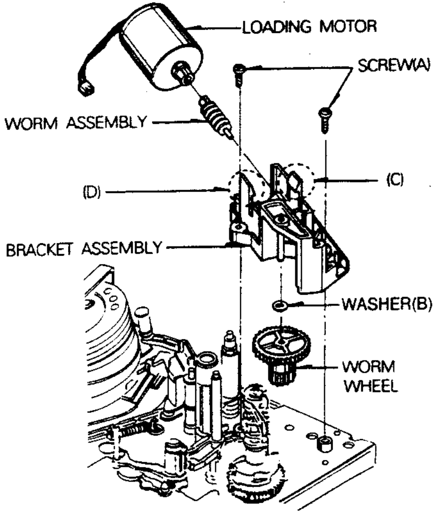

LOADING MOTOR
SCREW(A)
WORM ASSEMBLY
(D)
(C)
BRACKET ASSEMBLY
WASHER(B)
WORM WHEEL

Fig. B-6-2 Loading Motor Assembly

7. Take Up Lever(Fig. B-7)

1) Remove the Loading Motor Assembly.
2) Remove the Dew Bracket(Fig. B-5).
3) Remove the Pinch Lever Assembly(Fig. B-5).
4) Keep the Pinch Gear turned in the clockwise direction (180°).
5) Remove the Take-Up Lever by pushing the hook(A) outward.

• NOTE

1) When disassembling and reassembling

① When disassembling the Take-Up Lever, be careful not to break the Hook(A).

② When reassemble the Take-Up Lever, align the appendant Gear of Lever Take-Up with the appendant Gear of Take-up Arm

③ Reassemble the Take-Up Lever completely by hooking (A).

④ Be sure to replace together Take-Up Lever and Pinch Gear.

⑤ Be sure to assemble Pinch Lever Assembly before operating.

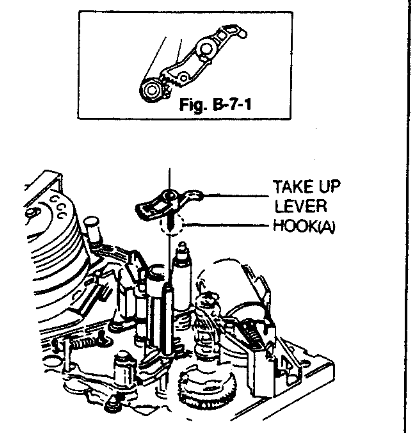


Fig. B-7-1
TAKE UP LEVER
HOOK(A)

Fig. B-7. Take-Up Lever

8. Take Up Arm Assembly(Fig. B-8)

1) Remove the Loading Motor Assembly.
2) Remove the Dew Bracket, Pinch Gear, and the Take-Up Lever.
3) Remove one Washer(A).
4) Remove the Take-Up Arm Assembly by lifting it up.
5) Remove the spring(B).

• NOTE

1) When reassembling

① Align the Gear of Take-Up Arm with the Gear of Take-Up Lever(Fig. B-7-1).

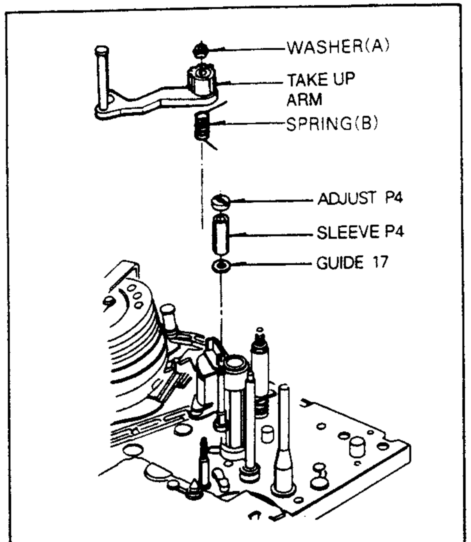

WASHER(A)
TAKE UP ARM
SPRING(B)
ADJUST P4
SLEEVE P4
GUIDE 17

Fig. B-8 Take-Up Arm Assembly/P4

9. P4 Assembly(Fig. B-8)

1) Remove the Adjust P4.
2) Remove the Sleeve P4.
3) Remove the Guide 17.

10. Pinch Gear(Fig. B-10-1, B-10-2)

1) Remove the Loading Motor Assembly.
2) Remove one Nut(A) and then remove the Dew Bracket (Fig. B-5).
3) Remove the Pinch Lever Assembly by lifting it up(Fig. B-5)
4) Keep the Pinch Gear turned in the clockwise direction (180°).
5) Remove the Take-Up Lever by pushing the hook(A) outward(Fig. B-7).
6) Keep the Pinch Gear turned in the counterclockwise direction (180°).
7) Remove the Pinch Gear Assembly.

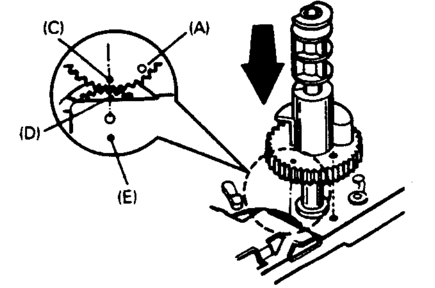


Fig. B-10-2 Pinch Gear

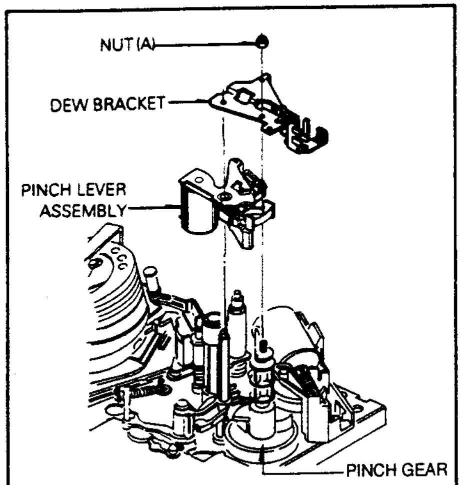

NUT(A)
DEW BRACKET
PINCH LEVER ASSEMBLY
PINCH GEAR

Fig. B-10-1 Pinch Gear Assembly

- **NOTE**

1) When reassembling, align the hole(A) of Pinch Gear with the hole of chassis, and the hole(C) of Pinch Gear with the groove(D) of the P.C.Gear. Hole(E) of chassis should be aligned with the hole of P.C.Gear.
2) Be sure to replace together Take-Up Lever and Pinch Gear.
3) Be sure to assemble Pinch Lever Assembly before operating.

11. FE(Full Erase) Head Assembly(Fig. B-11) (Optional Item)

1) Unplug the connector.
2) Remove one screw(A), and then remove the FE Head.

- **NOTE**

1) When disassembling and reassembling
① Do not touch the Video Head Tip with fingers or tools.

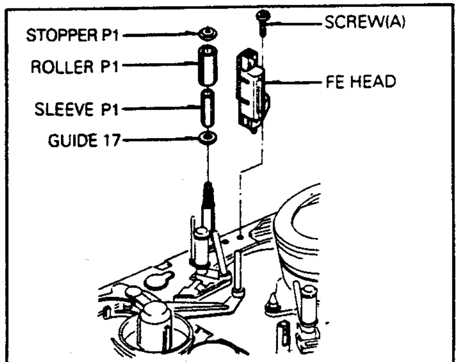

STOPPER P1
ROLLER P1
SLEEVE P1
GUIDE 17
SCREW(A)
FE HEAD

Fig. B-11 FE Head/P1

12. P1 Assembly(Fig. B-11)

1) Remove the Stopper P1.
2) Remove the Roller P1.
3) Remove the Sleeve P1.
4) Remove the Guide 17.

13. Tension Arm Assembly(Fig. B-13)

1) Remove one screw(C).
2) Remove the Tension Spring.
3) Remove the Tension Arm Assembly by pushing hooks outward with the Deck Mechanism Assembly turned over.
4) Remove the Tension Band Assembly from the Tension Arm by pushing Hooks of Holder(A).

- **NOTE**

1) When disassembling and reassembling, give special attention to the disassembling and reassembling of Tension Arm Assembly, because the Tension Band is interposed between the Supply Reel and the Soft Brake.

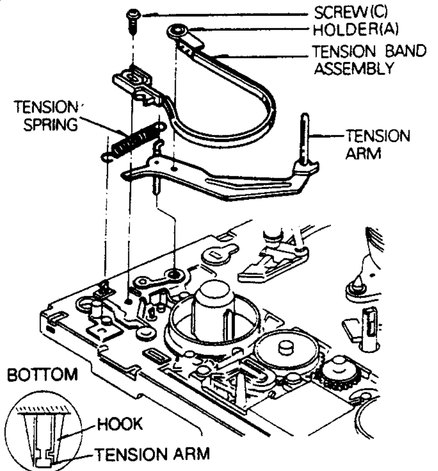

SCREW(C)
HOLDER(A)
TENSION BAND ASSEMBLY
TENSION SPRING
TENSION ARM
BOTTOM
HOOK
TENSION ARM

Fig. B-13 Tension Arm Assembly

14. Supply Soft/Supply Main/Take-Up Soft/Take-Up Main Brake Assembly

1) Supply Soft Brake(SSB)
   ① Remove the SSB Spring.
   ② Remove the SSB.
2) Supply Main Brake(SMB)
   ① Remove the SMB Spring.
   ② Remove the SMB.
3) Take Up Soft Brake(TSB)
   ① Remove the TSB Spring.
   ② Remove the TSB.
4) Take-Up Main Brake(TMB)
   ① Remove the TMB Spring.
   ② Remove the TMB.

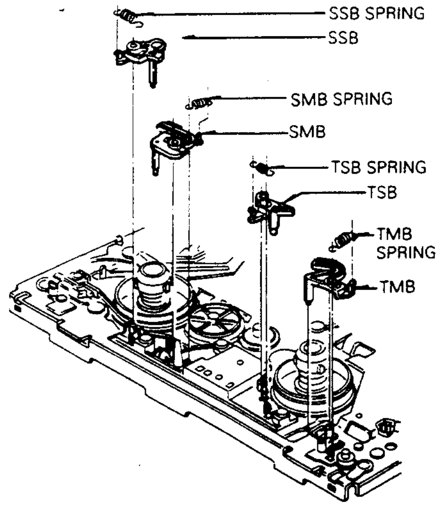

SSB SPRING
SSB
SMB SPRING
SMB
TSB SPRING
TSB
TMB SPRING
TMB

Fig. B-14 SMB/SSB/TMB/TSB

15. Bracket F/R(FF/Rewind) Assembly (Fig. B-15)

1) Remove the TMB.
2) Remove the Washer(A), and then remove the Gear F.R.
3) Remove three screws, and then remove Bracket F/R Assembly from the Deck Mechanism Assembly.
4) Remove the Washer(B), and spring Up/D, and then remove the Gear Up/D.
5) Remove the shaft(C), and then remove the Arm F.R, Lever F.R and Spring F.R.

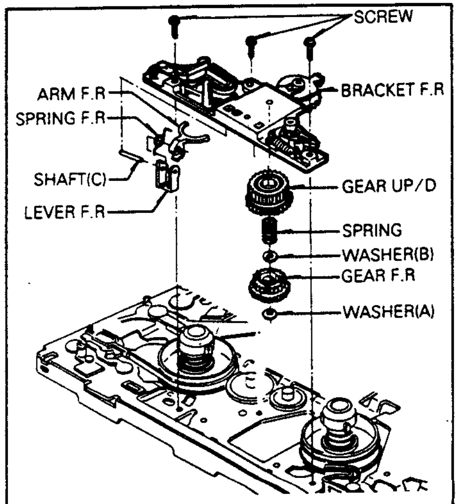

SCREW
ARM F.R
SPRING F.R
BRACKET F.R
SHAFT(C)
LEVER F.R
GEAR UP/D
SPRING
WASHER(B)
GEAR F.R
WASHER(A)

Fig. B-15 Bracket F.R Assembly

16. Supply Reel Assembly(Fig. B-16)

1) Remove the Tension Band Assembly.
2) Remove the Bracket F/R.
3) Lift up the Supply Reel Assembly from the Deck Mechanism Assembly.

17. Take Up Reel Assembly(Fig. B-16)

1) Remove the TMB(Fig. B-14)
2) Lift up the Take-up Reel Assembly from the Deck Mechanism Assembly.

• NOTE

1) When reassembling

① Make sure that the Supply and Take Up Reel are not exchanged.

② After reinstalling the Supply Reel Assembly, Adjust the Tension.

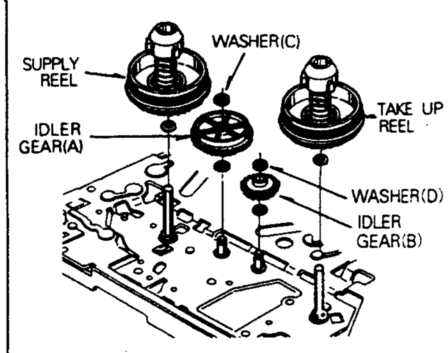

SUPPLY REEL
WASHER(C)
TAKE UP REEL
IDLER GEAR(A)
WASHER(D)
IDLER GEAR(B)

Fig. B-16 Supply Reel Assembly/Take-Up Reel Assembly

18. Idler Gear(A), (B)(Fig. B-16)

1) After removing the Supply Reel and supply Main Brake Assembly, remove the washer(C) and then remove the Idler Gear(A).
2) Remove the Washer(D) and remove the Idler Gear(B)

19. Pulley Gear Assembly(Fig. B-19)

1) Turn over the Deck Mechanism Assembly.
2) Remove the Capstan Belt.
3) Remove the Washer(A) and lift up the Pulley Gear

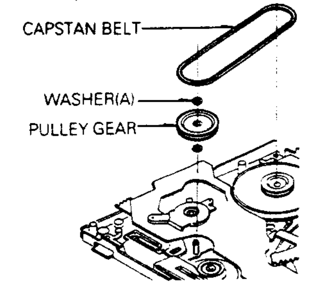

CAPSTAN BELT
WASHER(A)
PULLEY GEAR

Fig. B-19 Pulley Gear

20. Bracket Bottom Assembly(Fig. B-20)

1) Remove one screw(A).
2) Remove one Hexagonal Nut, and then lift up the Bracket Bottom Assembly.
3) Remove one Washer(C), and lift up the Ratchet Gear 1.
4) Remove the washer(D), and then remove Ratchet Gear 3 from the Bracket Bottom.

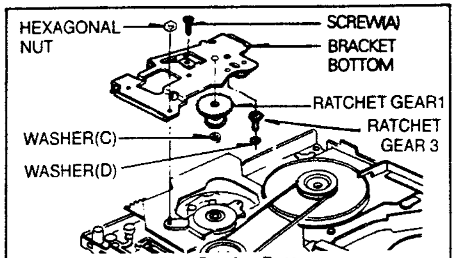

HEXAGONAL NUT
SCREW(A)
BRACKET BOTTOM
RATCHET GEAR1
RATCHET GEAR 3
WASHER(C)
WASHER(D)

Fig. B-20 Bracket Bottom

21. Junction PCB(Printed Circuit Board) Assembly(Fig. B-21-1)

1) Remove the Bracket Bottom Assembly.
2) Remove two screws(A), (B) and then remove the Junction P.C.B Assembly.
3) Remove the Mode Switch from the Junction P.C.B Assembly.
4) Remove the Reel Sensor, Sensor LEDS and each holder from the Junction P.C.B(Fig. B-21-2).

• NOTE

1) When reassembling the Mode Switch, the groove(V) and (U) of Mode Switch should be at their original place in the Eject Mode.

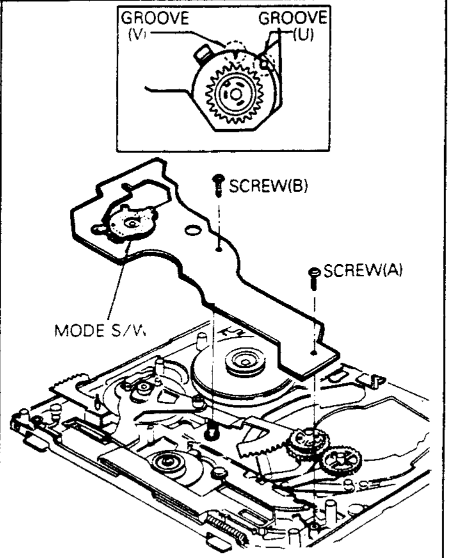

GROOVE (V)
GROOVE (U)
SCREW(B)
SCREW(A)
MODE S/W

Fig. B-21-1 Junction PCB Assembly

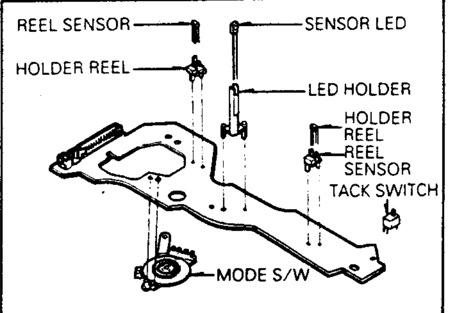

REEL SENSOR
SENSOR LED
HOLDER REEL
LED HOLDER
HOLDER REEL
REEL SENSOR
TACK SWITCH
MODE S/W

Fig. B-21-2 Mode S/W/Reel Sensor/Sensor Led

22. Capstan Motor and Brake Assembly (Fig. B-22-1)

1) Remove the Junction P.C.B Assembly
2) Hook the end of Capstan Brake Spring to the projection of Capstan Brake and then remove the Capstan Brake Assembly by lifting it up(Fig. B-22-2).
3) Remove two Screws(A), and then remove the Bracket C-Guide.
4) Remove the Connector.
5) Remove three screws(B), and then remove the Capstan Motor Assembly from the Deck Mechanism Assembly.

• NOTE

1) When disassembling and reassembling, hook end of the spring on the projection of Cap-Brake and remove it by lifting it up. Reassemble it in the opposite manner.

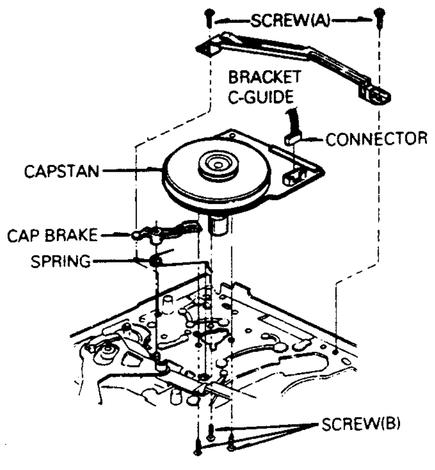

SCREW(A)
BRACKET C-GUIDE
CONNECTOR
CAPSTAN
CAP BRAKE
SPRING
SCREW(B)

Fig. B-22-1 Capstan Motor Assembly

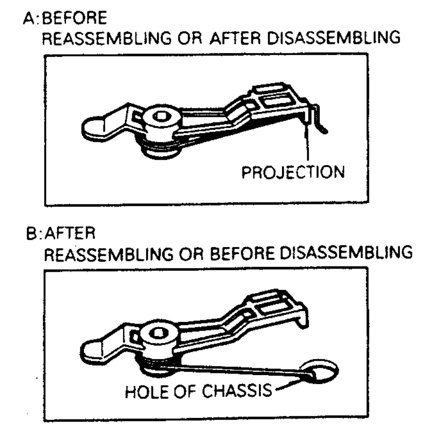

A:BEFORE
REASSEMBLING OR AFTER DISASSEMBLING
PROJECTION
B:AFTER
REASSEMBLING OR BEFORE DISASSEMBLING
HOLE OF CHASSIS

Fig. B-22-2 CAP Brake Assembly

23. Function Plate(Fig. B-23)

1) Remove two screws(B) in Eject Mode.
2) Remove the Function Plate Spring.
3) Push the Function Plate in the direction of arrow(A) and then lift it up.

• NOTE

1) When reassembling the groove of Lower part of Function Plate should be aligned with the shaft of Tension Lever Assembly (Fig. B-29).

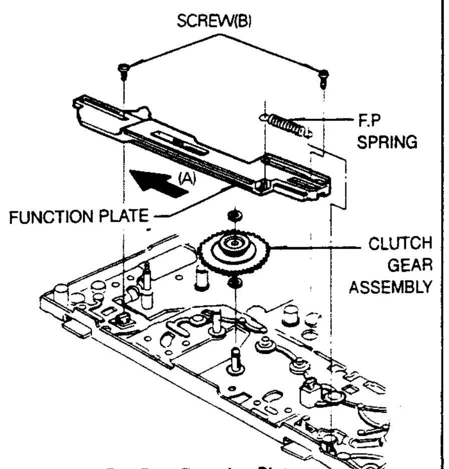

SCREW(B)
F.P SPRING
(A)
FUNCTION PLATE
CLUTCH GEAR ASSEMBLY

Fig. B-23 Function Plate

24. Ratchet Lever Assembly(Fig. B-24)

1) Remove the Function Plate.
2) Remove the Junction P.C.B Assembly.
3) Remove the Washer(A) and then remove the Ratchet Lever Assembly.
4) Remove the Ratchet Spring.
5) Remove the Ratchet Lever from the Ratchet 17 by lifting it up when the hook of it is aligned with the hole of Ratchet 17 while rotating it counterclockwise direction.
6) Remove the Washer(B), and turn over the Ratchet 17 and then remove the F-Lever Pin, Spring F-Lever.

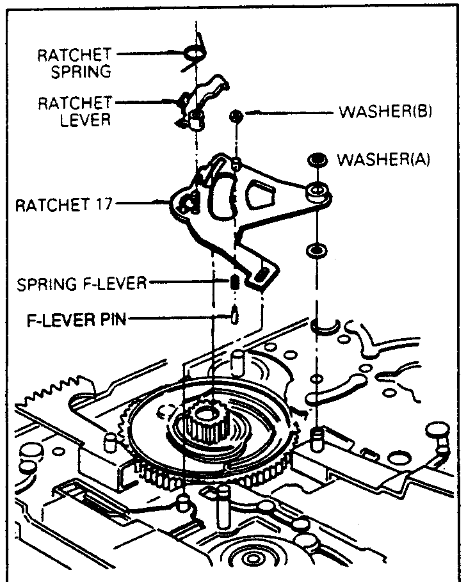

RATCHET SPRING
RATCHET LEVER
WASHER(B)
WASHER(A)
RATCHET 17
SPRING F-LEVER
F-LEVER PIN

Fig. B-24 Ratchet Lever Assembly

25. Cam Gear/Rack Gear T/Rack Gear FL(Fig. B-25-2)

1) Remove the washer(A) and remove the Ratchet Lever Assembly.(Fig. B-25-1).
2) Remove the washer(B), and then remove the Cam Gear (Fig. B-25-2).
3) Remove the Rack Gear F.L.(Fig B-25-3).
4) Remove the Washer(D).(Fig. B-25-3).
5) Remove the Rack Gear T.(Fig. B-25-3).

• NOTE

1) When reassembling

① Align the Projection of Rack Gear T with the hole of Loading Gear.

② Drive the Rack Gear F.L in the direction of arrow(D).

③ Hole of Cam should be aligned with the hole of chassis, and the groove(■) of Cam Gear should be aligned with the hole of PC Gear (Fig. B-26).

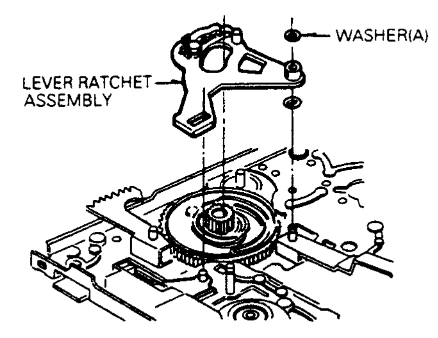

WASHER(A)
LEVER RATCHET ASSEMBLY

Fig. B-25-1 Lever Ratchet Assembly

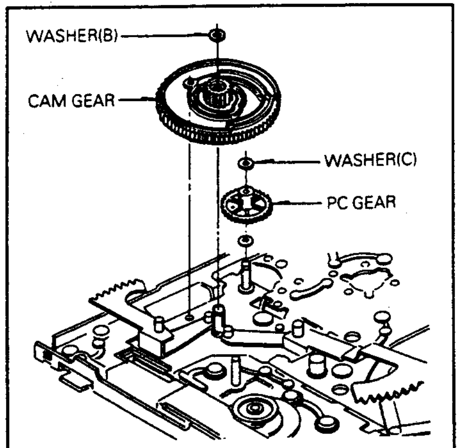

WASHER(B)
CAM GEAR
WASHER(C)
PC GEAR

Fig. B-25-2 CAM/PC Gear

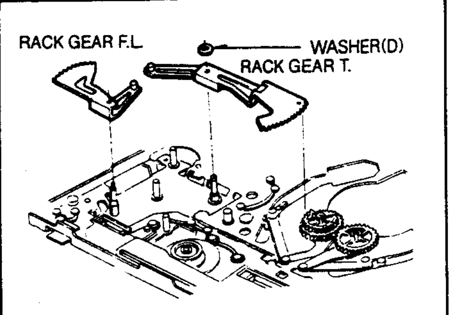

RACK GEAR F.L
WASHER(D)
RACK GEAR T.

Fig. B-25-3 Rack Gear F.L/Rack Gear T

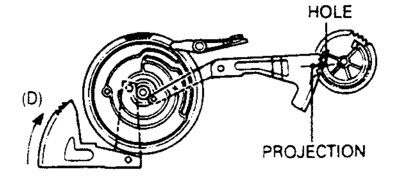

HOLE
(D)
PROJECTION

Fig. B-25-4 Rack Gear F.L/Rack Gear T/CAM Gear

26. PC Gear(Fig. B-26)

1) Remove the washer(C).
2) Remove the P.C Gear by lifting it up.

• NOTE

1) When reassembling

① The Groove of PC Gear should be aligned with the groove(V) of Cam Gear, and another hole of it should be aligned with the hole of chassis (Fig. B-26).

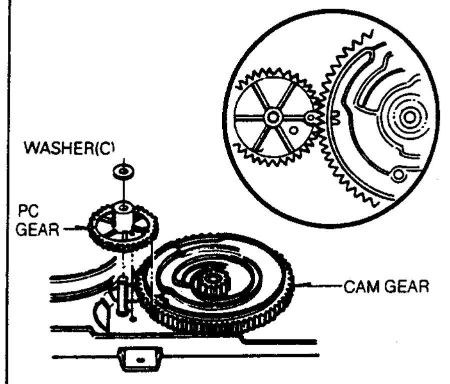

WASHER(C)
PC GEAR
CAM GEAR

Fig. B-26 PC Gear

27. P2 and P3 Slant Assembly(Fig. B-27)

1) After finishing the disassembly of Drum Assembly, remove the P2 and P3 Slant Assembly by turning the Loading Gear(R) in the clockwise direction.(Loading direction)
2) Loosen the set screws.
3) Remove the Roller Guide from the Slant Base.

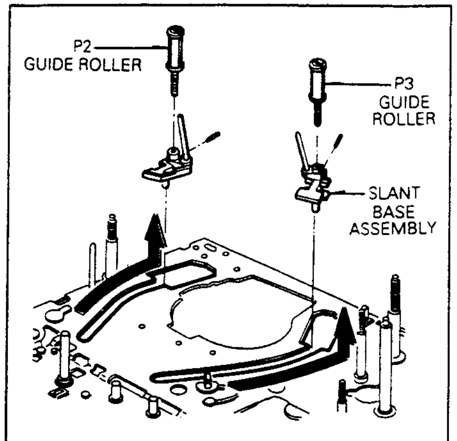

P2 GUIDE ROLLER
P3 GUIDE ROLLER
SLANT BASE ASSEMBLY

Fig. B-27 Slant Assembly

• NOTE

1) When disassembling and reassembling

① Use a Hexagonal wrench to remove set screw.

② Take notice that the P2 and P3 Slant Assembly should not be changed from their original place.

28. Loading Gear Assembly(L),(R) (Fig. B-28)

1) Remove the Cam Gear, Rack-T.
2) Remove the P2 and P3 Slant Assembly by turning the Loading Gear(L),(R) in the Loading direction
3) Lift up the Loading Gear Assembly(L),(R) from the Deck Mechanism Assembly.
4) Remove the Spring Load(L),(R).
5) Separate the Loading Gear(L), (R) from Arm Load(L), (R).

• NOTE

1) When reassembling

① Make sure that the Loading Gear(L) and (R) should not be changed from their original place.

② Align the groove of Loading Gear(L),(O) with the groove of Gear(R),(O).

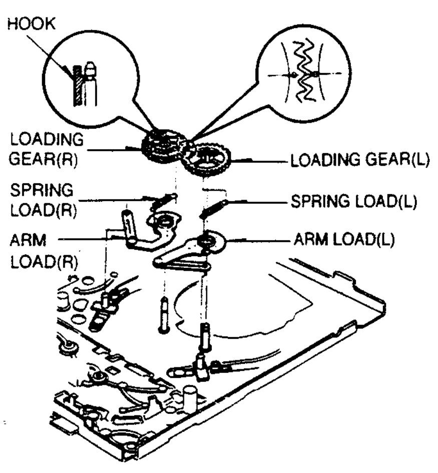

HOOK
LOADING GEAR(R)
LOADING GEAR(L)
SPRING LOAD(R)
SPRING LOAD(L)
ARM LOAD(R)
ARM LOAD(L)

Fig. B-28 Loading Gear Assembly

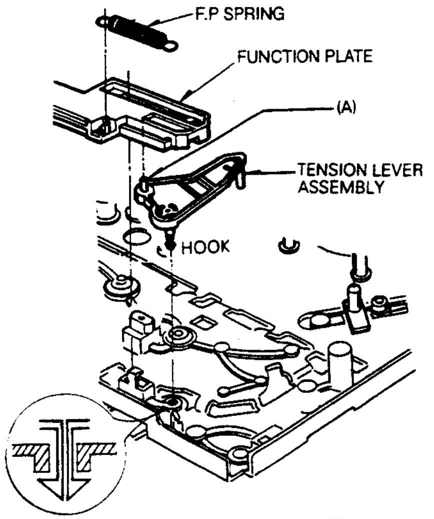

F.P SPRING
FUNCTION PLATE
(A)
TENSION LEVER ASSEMBLY
HOOK

Fig. B-29 Tension Lever Assembly

29. Tension Lever Assembly(Fig. B-29)

1) Remove the Function Plate.
2) Remove the Tension Lever Assembly by pushing hooks inward.

- **NOTE**

1) When reassembling

① Set the part(A) of Tension Lever Assembly in the groove of Lower part of Function Plate.

30. Clutch Gear Assembly(Fig. B-30)

1) Remove the Pulley Gear.
2) Remove the Plate Function.
3) Remove the washer(A), and then remove the Clutch Gear Assembly.

- **NOTE**

1) When reassembling

① Do not disassemble the Clutch Gear Assembly any futher, because Torque adjustment is not adjustible.

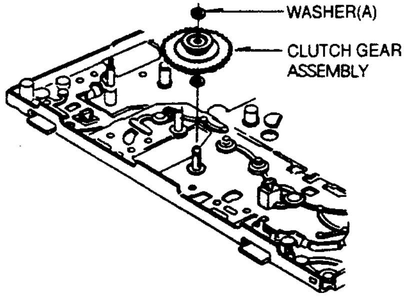
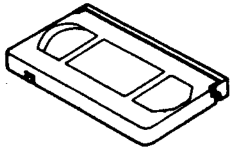
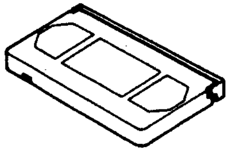
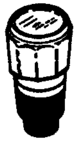
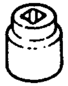
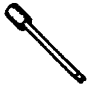
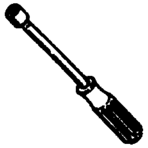

WASHER(A)
CLUTCH GEAR ASSEMBLY

Fig. B-30 Clutch Gear Assembly

MECHANISM ADJUSTMENTS

- **Tools and Fixtures for Deck**

1. Back tension meter Parts No : D00-D006 	2. Alignment tape Parts No NTSC: DTN-0001 PAL : DTN-0002 	3. Torque gauge Parts No : D00-D002 
4. Torque gauge adaptor Parts No : D09-R001 	5. Post height adjusting driver Parts No : DTL-0005 	6. M3 Nut driver Parts No : DTL-0006 

1. Mechanism State Switch (Mode Switch) Check

Purpose: To detect accurately the mechanism state and prevent the mechanism from malfunction.

Test Equipment/Fixture	VCR State	Check Point
● Blank tape	● Eject Mode (with cassette ejected)	● Mechanism state switch (Mode Switch and Cam)

Check Procedure

1) Turn the VCR on and eject the tape by pressing eject button.
2) Remove the Cabinet Top, the Main P.C.Board and the CST Housing. Then push the CST IN/OUT switch (Loca. #137) and eject button at the same time.
3) Turn the worm (Loca. #082) of Loading Motor Assembly (Loca. #A10) to the left side (counter-clockwise) to align the three holes (A) of the Pinch Gear, the P.C.Gear and the Chassis.
4) Remove the Bottom Cover and then check that the groove (V) and the hole (O) of Mode S/W are aligned each other. If the above alignment is not obtained, adjust as follows.
   (1) Remove the Bracket Assembly Bottom and the Capstan Belt in the state of power off.
   (2) Remove the P.C.B Assembly, align the groove (V) and the hole (O) of Mode S/W each other and then reassemble the P.C.B Assembly.
   (3) Turn the power on and perform the various operations to check that the loading and the unloading are correct.

Check Diagram

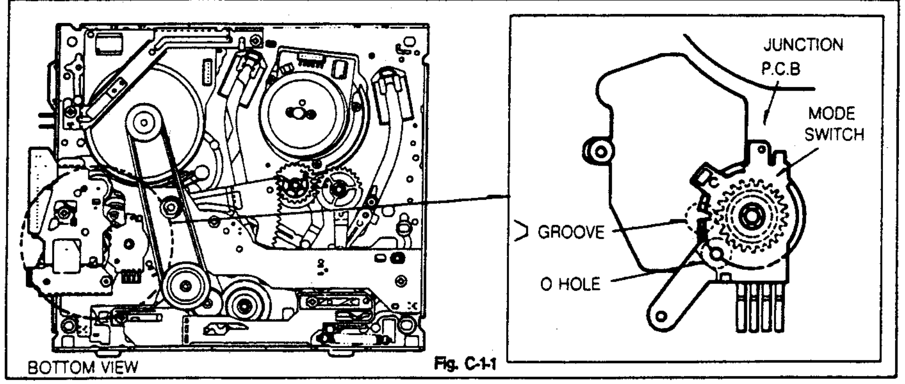


Fig. C-1-1

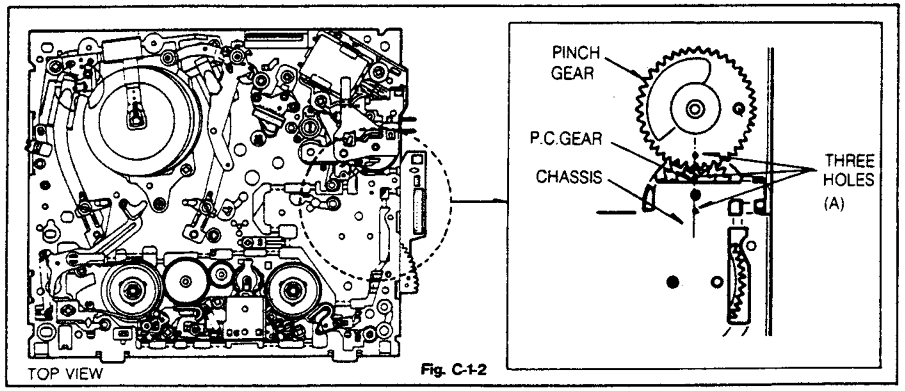


Fig. C-1-2

2. Preparation for Adjustment(To set VCR to the loading state without inserting a cassette)

1) Unplug the power cord from the AC outlet.
2) Remove the Cabinet Top and Front Loading mechanism.
3) Plug the power cord into the AC outlet.
4) Turn the VCR on and push the tact switch in the PCB Assembly.
   The VCR can accept input of each mode in this case. However the rewind and review operation cannot be performed for more than a few seconds because the take-up reel table is in the stop state and reel pulses cannot be detected.

(NOTE)

Always return the VCR to the Front Loading Mechanism Assembling State in the following order after the above operations have been performed.

1) Press the Eject button after turning the power on.
2) Wait for about 10 seconds until searching out the assembly position.
3) Assemble the Front Loading Mechanism and connect the Front Loading Mechanism Connector.
4) Refer to the "Front Loading Mechanism Disassembly" which is described previously.

3. Tension Post Position and Tension Adjustment

Purpose: To make the tension of tape constant so that the contact between the video heads and tape is stabilized.

Test Equipment/Fixture	VCR State	Adjustment Point
● Tension Meter (Tension adjustment)	● Play without cassette and with a Tension Meter	● Holder Band(B)

Adjustment Procedures

⟨Position Adjustment⟩

1) Perform loading without inserting a tape and loosen the screw that attaches the Holder Band(B) to the Deck Mechanism Assembly.
2) Insert the (-)type driver between the Holder Band(B) and the "V" groove of the chassis.
3) Move the Holder Band(B) right and left and align the center of tension post(Guide T-Post) with the center of P1(Shaft P1).(tolerance:Less than ±0.3mm)
4) Tighten the screw that attaches the Holder Band(B) to Deck Mechanism Assembly.

⟨Tension Adjustment⟩

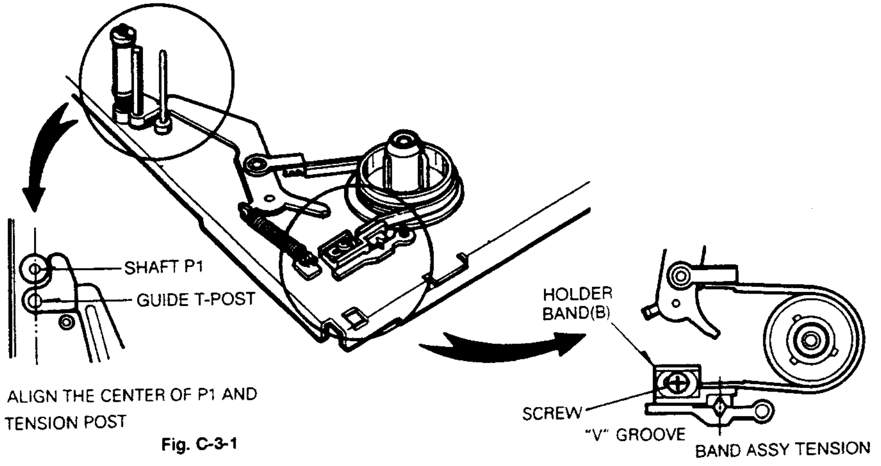
1) Play the Tension Meter and read the Tension Meter: 38g•cm±4g•cm(reference value).
2) If the result is abnormal.
   (1) over the standard:loosen the screw, move the Holder Band(B) to the right a little and then tighten the screw and make sure that this adjustment is correct.
   (2) below the standard:loosen the screw, move the Holder Band(B) to the left a little and then tighten the screw and make sure that this adjustment is correct.

****CAUTION****

The range of movement of Holder Band(B) should be within ±1.5mm while being adjusted.

If the range is over, you should recheck the Reel Brake, Tension Arm and Spring.

Adjustment Diagram



ALIGN THE CENTER OF P1 AND TENSION POST

Fig. C-3-1

Fig. C-3-2

4. Checking Torque

Purpose: It is necessary to check the tension, torque and compression force at the tape take-up section and moving section to make the tape run smoothly and satisfy the basic performance of the VCR. Check these if the tape does not run smoothly or the tape speed is abnormal.

Test Equipment/Fixture	VCR state
● Torque Gauge ● Torque Gauge Adaptor ● Cassette Torque Meter SRK-VHT-063 : Play, Cue SRK-VHT-303 : Review	● Set the VCR to each operation mode without inserting a cassette. (See '2 Preparation for Adjustment')

Item	VCR Operation mode	Measurement Reel	Measurement Values
Main brake torque.	Eject	Supply and take-up reels	600g.cm or more
Slack removal torque	Unloading(power off)	Supply reel	120~220g·cm
Fast forward torque	Fast forward	Take-up reel	600g·cm or more
Rewind torque	Rewind	Supply reel	600g·cm or more
Play take-up torque	Play	Take-Up reel	90~150g·cm
Review Torque	Review	Supply Reel	120~180 g.cm
CUE Torque	Cue	Take-Up Reel	110~170 g.cm

Checking Method

The values are measured by using a torque gauge and torque gauge adaptor with the torque gauge fixed.

Note: This value is measured when the VCR is shifted in the unloading direction from the fast forward or rewind mode and quick braking is applied to both Reel Tables.

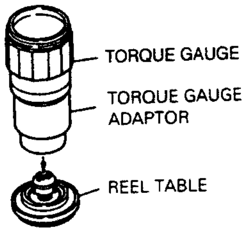


Fig. C-4

5. Guide Roller Height Adjustment

Purpose: To regulate the height of tape so that the bottom of tape runs along the tape guide line on the lower drum.

A. Preliminary Adjustment

Test Equipment/Fixture	VCR State	Adjustment Point
● Hexagonal Wrench or Bended Drive (+) Type ● Post Height Adjusting Driver	● Play an alignment tape	● Guide Roller Height Adjustment Screws on the Supply and Take-Up Guide Rollers.

Adjustment Procedure

1) Perform the precise adjustment.
2) When the Guide Roller is damaged, release the Guide Roller retaining screw and then replace the Guide Roller.

Adjustment Diagram

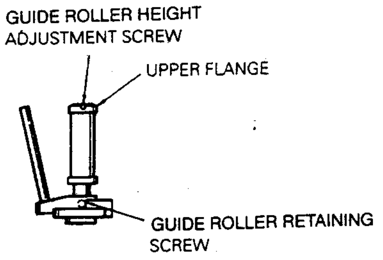

GUIDE ROLLER HEIGHT
ADJUSTMENT SCREW
UPPER FLANGE
GUIDE ROLLER RETAINING
SCREW

Fig. C-5-1

B. Precise Adjustment

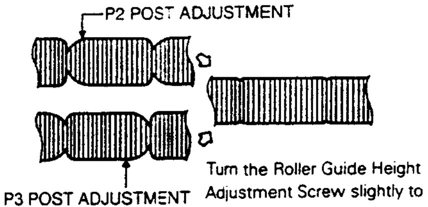
Test Equipment/Fixture	Test Equipment Connection Points	VCR State	Adjustment Point
● Oscilloscope ● Post Height Adjusting Driver ● Alignment Tape(30HMP-2) ● Hexagonal wrench	● CH-1: PB RF Envelope ● CH-2 (NTSC : SW30Hz PAL : SW25Hz) ● Head Switching Output Point ● RF Envelope Output Point	● Play an alignment tape	● Guide Roller Height Adjustment Screws.

Adjustment Procedure

1) Play an alignment tape after connecting the probe of the oscilloscope to RF Envelope Output Test Point and Head Switching Output Test Point.
2) Tracking control(in PB mode): Center position(When this adjustment is performed after the drum assembly has been replaced, set the tracking control so that the RF output is maximum.)
3) Height adjustment screw: Flatten the RF waveform.
4) Turn(Move) the tracking control(playback) clockwise and counterclockwise.(to the right and left)
5) Check that any drop of RF output is uniform at the start and end of the waveform.

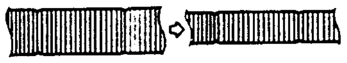
****CAUTION****
If the adjustment is excessive or insufficient the tape is jammed or folded.

Waveform Diagrams


P2 POST ADJUSTMENT
P3 POST ADJUSTMENT

Turn the Roller Guide Height Adjustment Screw slightly to flatten the waveform.

Fig. C-5-2

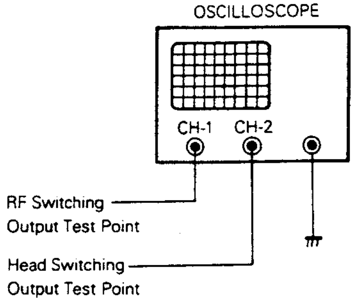


Tracking control at center

Turn(Move) the tracking control to both directions.

Fig. C-5-3

Connection Diagram


OSCILLOSCOPE
CH-1
CH-2
RF Switching
Output Test Point
Head Switching
Output Test Point

6. Audio/Control(A/C) Head Adjustment

Purpose: To keep the contact between the tape and head so that the specificed track is recorded and played back.

A. Preliminary Adjustment (Perform the preliminary adjustment, when there is no Audio Output signal with alignment tape.)

Test Equipment/Fixture	VCR State	Adjustment Points
● M3 Nut Driver		● Special screw ● Cone Point Screw for tilt ● Azimuth Adjustment Screw ● A/C Head Adjuster
● Blank tape	● Run the blank tape	

Adjustment procedure/Adjustment Diagram

1) Tighten the special screw so that the spring section protrudes 6.4mm(approx.) over the top of Head Base (1).

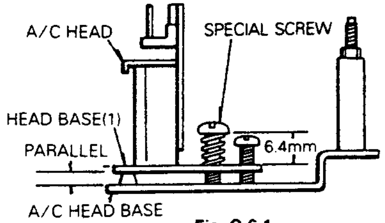


Fig. C-6-1

2) Turn the Azimuth Adjustment Screw and Cone Point Screw so that the Head Base(1) and A/C Head Base are parallel.

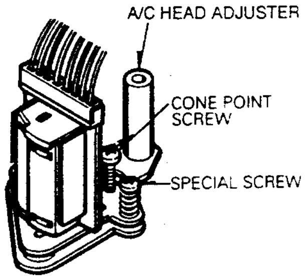


Fig. C-6-2

3) Load a blank tape and set the VCR to the play mode.

4) Confirm that the tape runs fittingly to the lower limit of the P4 post. Also confirm that the tape runs smoothly.

5) If adjustment is required, turn Cone Point Screw clockwise until curling is apparent at the lower edge of P4. Then turn Cone Point Screw counterclockwise until the curling smooths out.

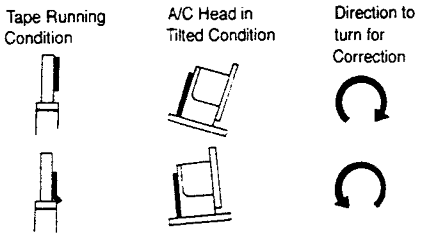

Tape Running Condition
A/C Head in Tilted Condition
Direction to turn for Correction

Fig. C-6-3

6) Check that there is no conspicuous curling and folding around the A/C head. If there is conspicuous curling or folding, readjust the Cone Point Screw, Azimuth Adjustment Screw and A/C Head Adjuster. When the bottom edge of tape is 0.20~0.25mm from the bottom edge of the control head's core, the height of A/C head is ideal.

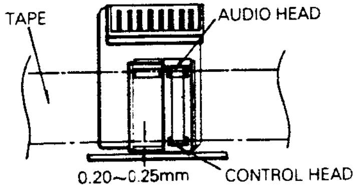


Fig. C-6-4

7) If necessary repeat steps 1 through 4 until a precise adjustment is achieved.

B. Precise Adjustment

Test Equipment/Fixture	Test Equipment Connection Point	VCR State	Adjustment Points
● Oscilloscope	● Audio output jack	● Play an alignment tape 1KHz, 7KHz sections	● Azimuth Adjustment Screw ● A/C Head adjuster ● Cone point screw
● Alignment tapes ● M3 Nut Driver			

Adjustment Procedure

1) Connect the probe of oscilloscope to audio output jack.
2) Adjust the Azimuth Adjustment Screw, A/C Head adjuster and cone point screw slightly and alternately so that an Audio 1KHz output is maximum and flat. (minimum fluctuation).
3) Adjust the Azimuth Adjustment Screw slightly and alternately so that the Audio 7KHz output is maximum.

Waveform Diagram

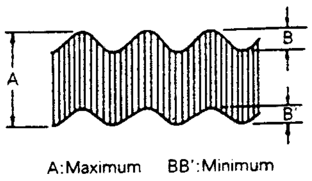


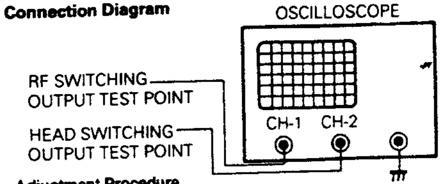
Fig. C-6-5

7. X-Value Adjustment

Purpose: To obtain compatibility with other VCRs.

Test Equipment/Jigs	Test Equipment Connection Points	VCR State	Adjustment Points
● Oscilloscope ● Alignment tapes ● Post Height Adjusting Driver	● CH-1:PB RF Envelope ● CH-2:SW 30Hz ● Head Switching Output Test Point ● RF Envelope Output Test Point	● Play an alignment tape	● Adjust X

Connection Diagram


OSCILLOSCOPE
RF SWITCHING OUTPUT TEST POINT
HEAD SWITCHING OUTPUT TEST POINT
CH-1
CH-2

Adjustment Procedure

1) Insert a cassette tape, and then "AUTO TRACKING" will be displayed on the Digitron, then push the Tracking ⊕ or ⊖ Keys one time as soon as possible to make the VCR release the Auto Tracking.
2) Turn the Adjust X to the maximum RF Envelope level when the VCR is free from the Auto tracking.
3) If RF envelope output is maximized from the center click position in the right direction (clockwise), set the tracking control to the center and turn the X Adjust counterclockwise.
4) If in the left direction (counterclockwise), turn it clockwise by the same method.
5) In case of the 30 μ m, head will trace over a 60 μ m width track, readjust it so that RF Envelope output begins falling at the same angle when tracking control is turned either left or right.

Adjustment Diagram

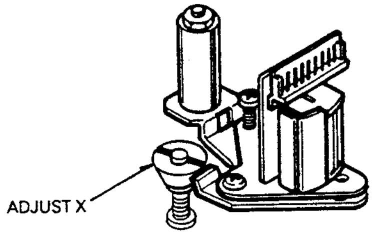


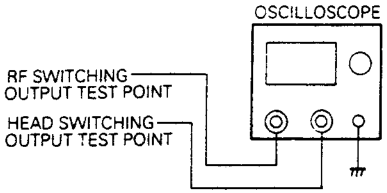
Fig. C-7

8. Adjustment after Replacing Drum Assembly(Video Heads)

Purpose: To suppress drift in the height relative to the Guide Roller and drift of the X Value after replacing the drum.

Test Equipment/Fixture	Test Equipment Connection Points	VCR State	Adjustment Points
● Oscilloscope ● Post Height Adjusting Driver ● Alignment tape ● Blank tape ● M3 Nut Driver	Checking the flatness ● CH-1 : PB RF Envelope ● CH-2 (NTSC : SW30Hz PAL : SW25Hz ● Head Switching Output Point ● RF Envelope Output Point	● Run the blank tape ● Play an alignment tape	● Guide Rollers Precise Adjustment ● Switching point ● Tracking point ● X-Value

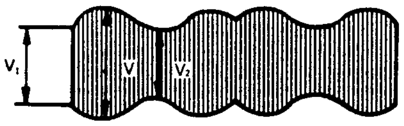
Connection Diagram


OSCILLOSCOPE
RF SWITCHING OUTPUT TEST POINT
HEAD SWITCHING OUTPUT TEST POINT

Checking/Adjustment Procedure

1) Run the blank tape, check and adjust whether the Roller Guide is curling or creasing tape around the Roller Guide.
2) Check the RF envelope output flatness and adjust the Roller Guide Height while playing an alignment tape.
3) Adjust the head switching point.
4) Check that RF envelope output is maximum when the tracking is at the initial position.
5) Adjust the Tracking Preset and X-Value Adjust with X Adjust.

Waveform Diagram



V_1/V MAX > 0.7
V_2/V MAX > 0.8
RF ENVELOPE OUTPUT

Fig. C-8

9. Check of Tape Travel after reassembling Deck Assembly

9-1. Check Audio and RF Locking Time during playback after CUE or REV.

Test Equipment/Fixture	Specification	Test Equipment Connection Point	VCR State
● Oscilloscope ● Alignment tape (with 6H 3kHz Color Bar Signal) ● Stop Watch	● RF Locking Time : Less than 5 sec. ● Audio Locking Time : Less than 10 sec.	● CH-1 : PB RF Envelope ● CH-2 : Audio Output ● RF Envelope Output Point ● Audio Output Jack	● Play an alignment tape (with 6H 3kHz Color Bar Signal)

Checking Procedure

1) Change the mode of CUE or REV to play.
2) At this time, confirm that the Locking Time of Audio and RF Output Waveform fits to specification.
3) If the results checked above are abnormal, reapeat adjustments 4 through 8.

9-2. Check the coincidence of both Audio and Video Sync.(Lip Sync.)

Test Equipment/Fixture	Specification	Test Equipment Connection Point	VCR State
● Oscilloscope ● 2H 9V Tape(for X-Value Adjustment Coincidence) or alignment tape	● Less than ±0.5V	● CH-1 : PB RF Envelope ● CH-2 : Audio Output ● RF Envelope Output Point ● Audio Output Jack	● Play a 2H 9V tape or an alignment tape.

Checking Procedure

1) Confirm that the period Ⓐ of Fig. C-9-1 is within ±5V.
2) If the result is abnormal, repeat adjustment #7. (X-Value adjustment).

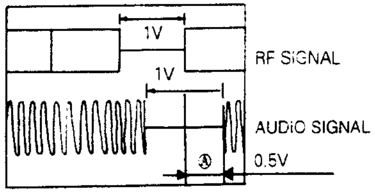


Fig. C-9-1

9-3. Check the occurance of tape curl and jam

Test Equipment/Fixture	Specification	VCR State
● T-160 Tape ● T-120 Tape	● Be sure there is no jam or curl at the beginning, the middle period or the end of the T-160 tape.	● Run the CUE, REV play mode at the beginning and the end of the tape.

Checking Procedure

1) Confirm whether the state of each transportation post is normal.
2) Make sure nothing is wrong with the operation of the Counter, when the lower part of tape is folded.
3) Be sure there is nothing wrong in the Audio signal, when the upper part of tape is folded.
4) If the result s abnormal, repeat adjustment #5 and #6.

9-4. Check the adjustment state of Take-Up Guide

Test Equipment/Fixture	Specification
● T-120 Tape ● Take-Up Guide Adjusting Driver	● Review : Travel the tape that align the top of the P4 Guide and the bottom of the Tape or be folded. ● Play : Travel the tape that align the top of the P4 Guide and the bottom of the Tape.

Checking Procedure

1) Run the CUE or PLAY mode at the middle period or the end of the T-120 tape.
2) Run the REV mode at the play or cue part of tape.
3) At this time, confirm that the change of tape height at the P4 Guide fits to specification.
4) If the result is abnormal, refer to Table 9-1.
5) Play the beginning of T-120 tape(within 5 min.)
6) Confirm that the state of tape transportation fit to specification in P4 Guide.
7) Remove the Tension Arm Assembly by rotating in the clockwise direction and then confirm that the state of tape transportation fit to specification.
8) If the result is abnormal, refer to Table 9-1.

PLAY Mode	REV Mode	Adjustment Method
Tape Falling	Tape Lift	Bend the shaft of the direction +Y.
Tape Lift	Tape Falling	Bend the shaft of the direction -Y.

Table 9-1

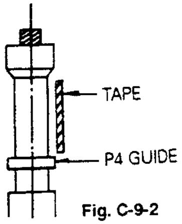


Fig. C-9-2

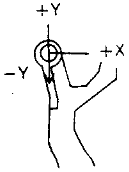


Fig. C-9-3

10. Maintenance/Inspection Procedure

(1) Required Maintenance

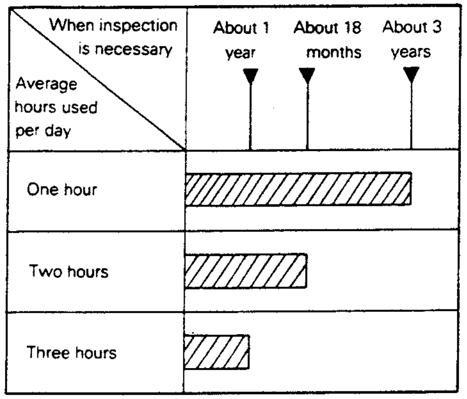
The recording density of a VCR is much higher than that of an audio tape recorder. VCR components must be very precise, at tolerances of 1/1000mm, to ensure compatiblity with other VCRs. If any of these components are worn or dirty, the symptoms will be the same as if the part is defective. To ensure good picture, periodic inspection and maintenance, including replacement of worn out parts and lubrication, are necessary.

(2) Scheduled Maintenance

Schedules for maintenance and inspection are not fixed because they vary greatly according to the way in which the customer uses the VCR, and the environment in which the VCR is used.

But, in general home use, a good picture will be maintained if the inspection and maintenance is made every 1,000hours. The table below shows the relation between time used and inspection period.

Table 1



(3) Check before starting repairs

The following faults can be remedied by cleaning and oiling. Check the needed lubrication and the conditions of cleanliness in the unit.

Check with the customer to find out how often the unit is used, and then determine that the unit is ready for inspection and maintenance. Check the following parts.

Table 2

Phenomenon	Inspection
Poor S/N, no color	Dirt on video head or worn video head
Tape does not run or tape is slack	Dirt on pressure roller, belt or flywheel belt
Vertical jitter, horizontal jitter	Dirt on video head or in tape transport system
Color beats	Dirt on full-erase head
Low volume or sound distorted	Dirt on audio/control head
Fast forward or rewind is not done or rotation is slow	Dirt on belt

(4) Supplies Required for Inspection and Maintenance

(1) Greases Kanto G-31(or equivalent)
(2) Alcohol(Isopropyl Alcohol)
(3) Cleaning Patches

5) Maintenance Procedure

5-1) Cleaning

(1) Cleaning video head

First use a cleaning tape. If dirt on head is too stubborn to remove by tape, use the cleaning patch. Coat the cleaning patch with alcohol(Isopropyl Alcohol) to the point indicated. Touch the cleaning patch to the head tip and gently turn the head(rotating cylinder) right and left.

(Do not move the cleaning patch vertically and make sure that only the buckskin on the cleaning patch comes into contact with the head. Otherwise, the head may be damaged.)

Thoroughly dry the head. Then run test tape. If alcohol (Isopropyl Alcohol) remains on the video head, the tape may be damaged when it comes into contact with the head surface.

(2) Clean the tape transport system and drive system, etc. by wiping with a cleaning patch wetted with alcohol (Isopropyl Alcohol).

Note:

① It is the tape transport system which comes into contact with the running tape. The drive system consists of those parts which move the tape.

② Make sure that during cleaning you do not touch the tape transport system with the tip of a screw driver and no force is applied to the system that would cause deforming.

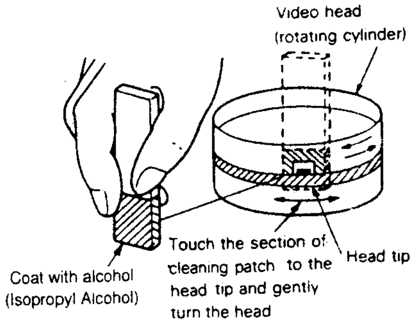

Video head
(rotating cylinder)
Touch the section of cleaning patch to the head tip and gently turn the head
Head tip
Coat with alcohol
(Isopropyl Alcohol)

Fig. C-10-1

5-2) Greasing

(1) Greasing guidelines

Apply grease, with a cleaning patch. Do not use excess grease. It may come into contact with the tape transport of drive system. Wipe any excess and clean with cleaning patch wetted in alcohol(Isopropyl Alcohol).

(2) Periodic greasing

Grease specified locations every 5,000hours.

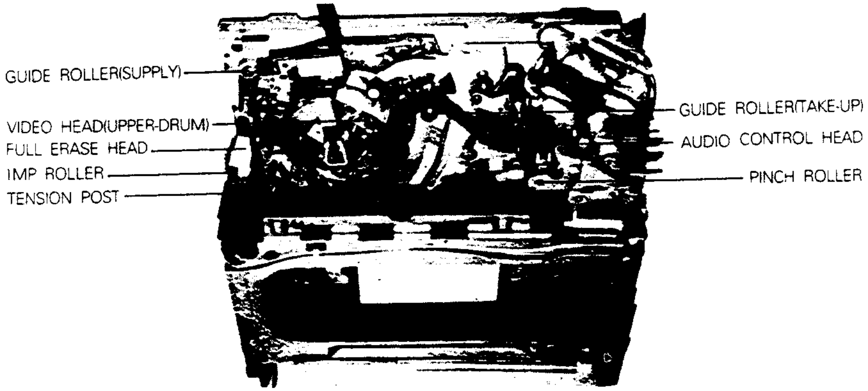


Fig. C-10-2 Tape Transport System

Phenomenon	Inspection	Replacement	
Color beats	Dirt on full-erase head	○	→ ①
Poor S/N no color	Dirt on video head	○	→ ②
Vertical jitter	Dirt on video head Dirt in tape transport system	○	→ ③
Low volume, Sound distorted	Dirt on audio/control head	○	→ ④
Tape does not run. Tape is slack	Dirt on pinch roller	○	→ ⑤

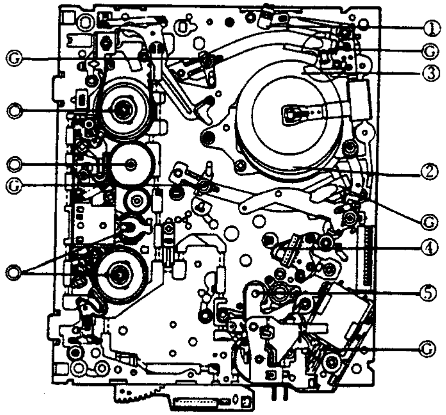


Fig. A-11 Top View of Mechanism

Phenomenon	Inspection Location	Replacement	
Do not fast forward or rewind, or rotation is slow	Dirt on reel belt	○	→ ⑥
Tape does not run			
Slack tape			

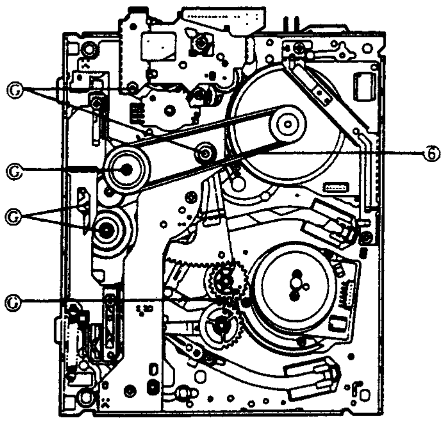


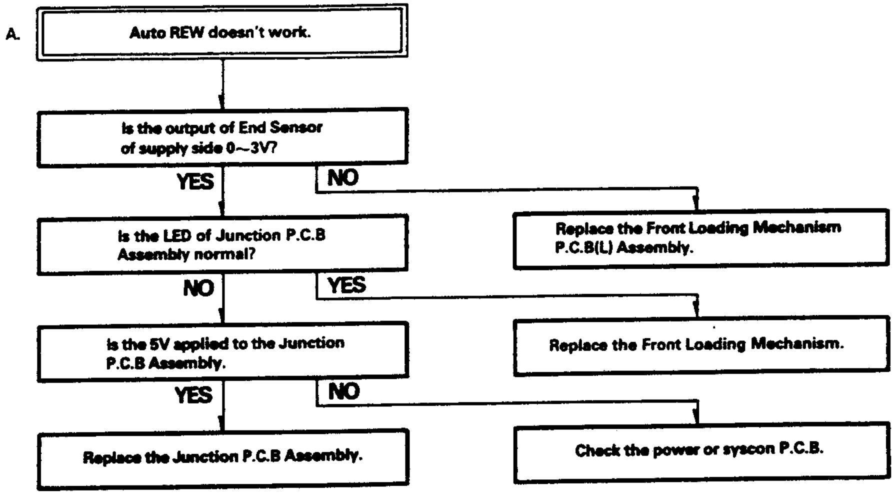
Fig. A-12 Bottom View of Mechanism

Note: If locations marked with ○ do not operate normally after cleaning, check for wear and replace. See the EXPLODED VIEWS at the end of this manual as well as the above illustrations for the sections to be lubricated and greased.

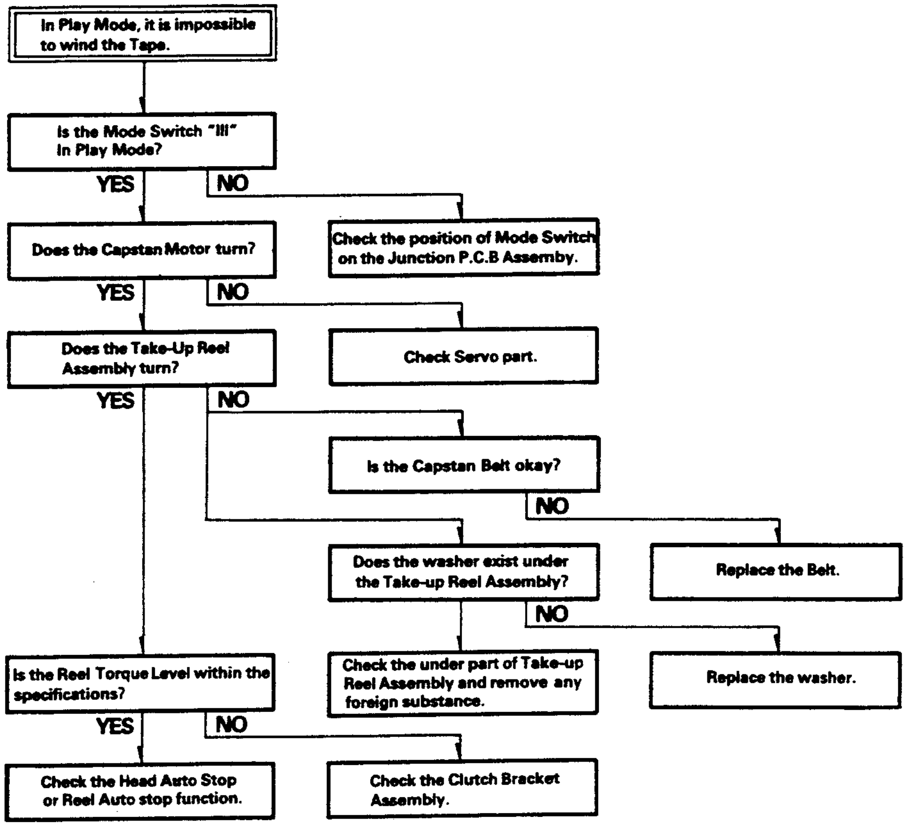
Ⓖ:Grease
Ⓞ:Oil

MECHANISM TROUBLESHOOTING GUIDE

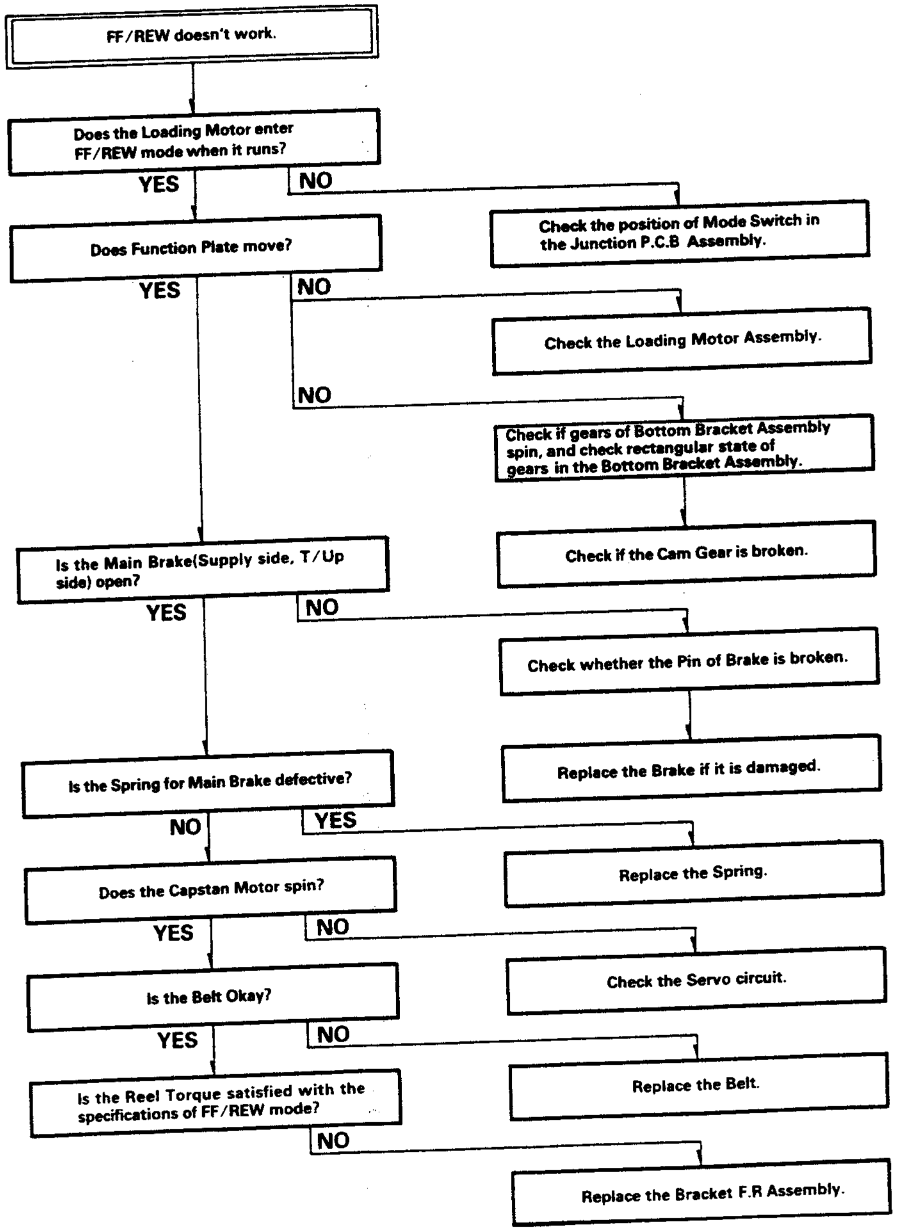
1. Deck Mechanism


A.
Auto REW doesn't work.
Is the output of End Sensor of supply side 0~3V?
YES
NO
Is the LED of Junction P.C.B Assembly normal?
Replace the Front Loading Mechanism P.C.B(L) Assembly.
NO
YES
Is the 5V applied to the Junction P.C.B Assembly.
Replace the Front Loading Mechanism.
YES
NO
Replace the Junction P.C.B Assembly.
Check the power or syscon P.C.B.

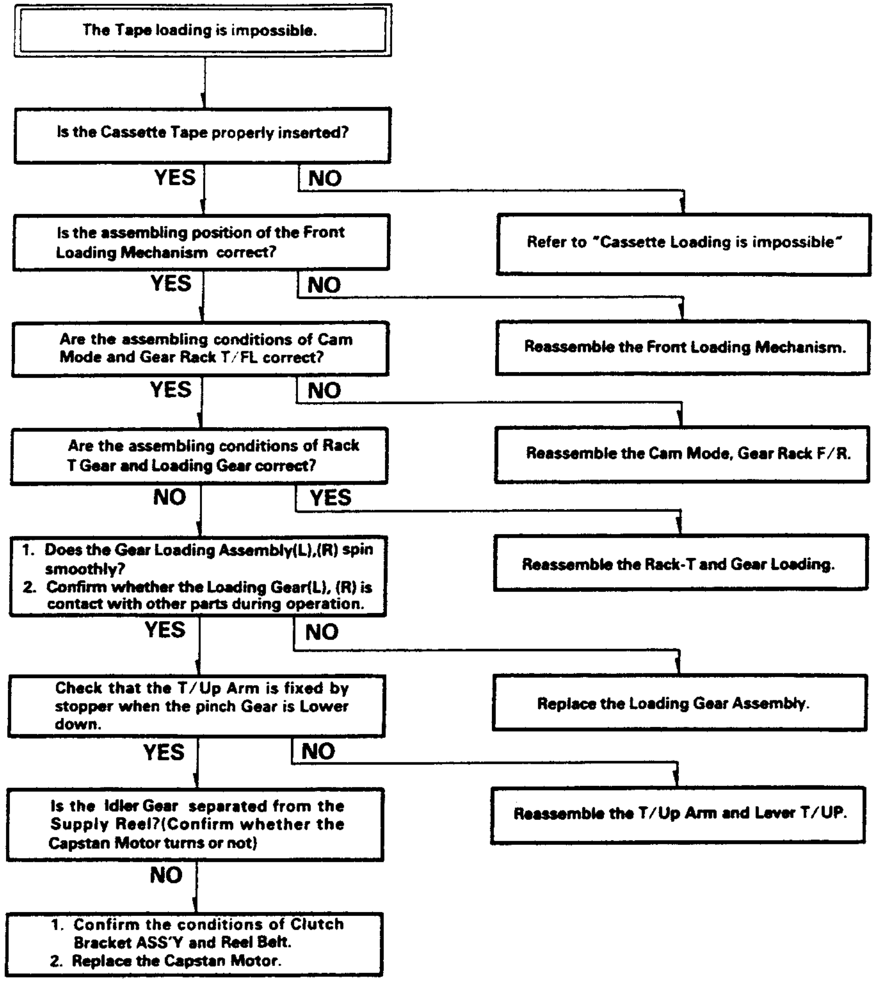
B.


In Play Mode, it is impossible to wind the Tape.
Is the Mode Switch "III" In Play Mode?
YES
NO
Check the position of Mode Switch on the Junction P.C.B Assemby.
Does the Capstan Motor turn?
YES
NO
Check Servo part.
Does the Take-Up Reel Assembly turn?
YES
NO
Is the Capstan Belt okay?
NO
Replace the Belt.
Does the washer exist under the Take-up Reel Assembly?
NO
Replace the washer.
Check the under part of Take-up Reel Assembly and remove any foreign substance.
Is the Reel Torque Level within the specifications?
YES
NO
Check the Head Auto Stop or Reel Auto stop function.
Check the Clutch Bracket Assembly.

C.

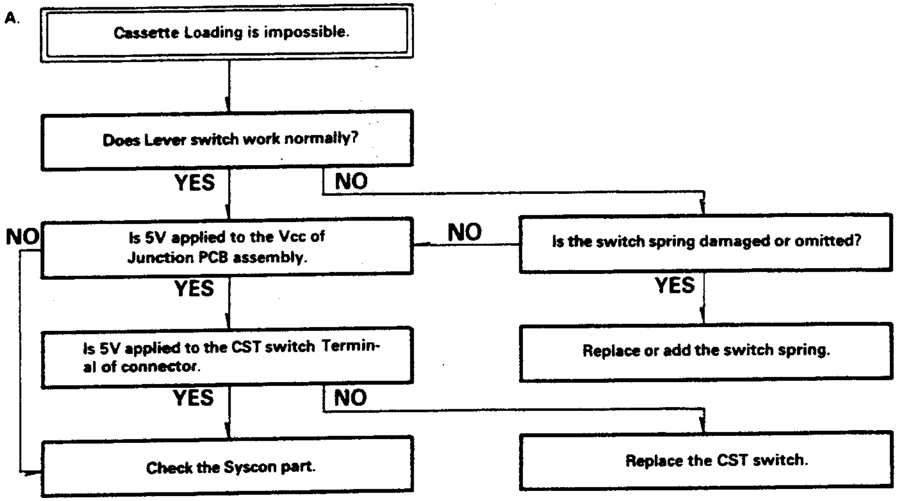

FF/REW doesn't work.
Does the Loading Motor enter FF/REW mode when it runs?
YES
NO
Check the position of Mode Switch in the Junction P.C.B Assembly.
Does Function Plate move?
YES
NO
Check the Loading Motor Assembly.
NO
Check if gears of Bottom Bracket Assembly spin, and check rectangular state of gears in the Bottom Bracket Assembly.
Check if the Cam Gear is broken.
Is the Main Brake(Supply side, T/Up side) open?
YES
NO
Check whether the Pin of Brake is broken.
Replace the Brake if it is damaged.
Is the Spring for Main Brake defective?
NO
YES
Replace the Spring.
Does the Capstan Motor spin?
YES
NO
Check the Servo circuit.
Is the Belt Okay?
YES
NO
Replace the Belt.
Is the Reel Torque satisfied with the specifications of FF/REW mode?
NO
Replace the Bracket F.R Assembly.

D.

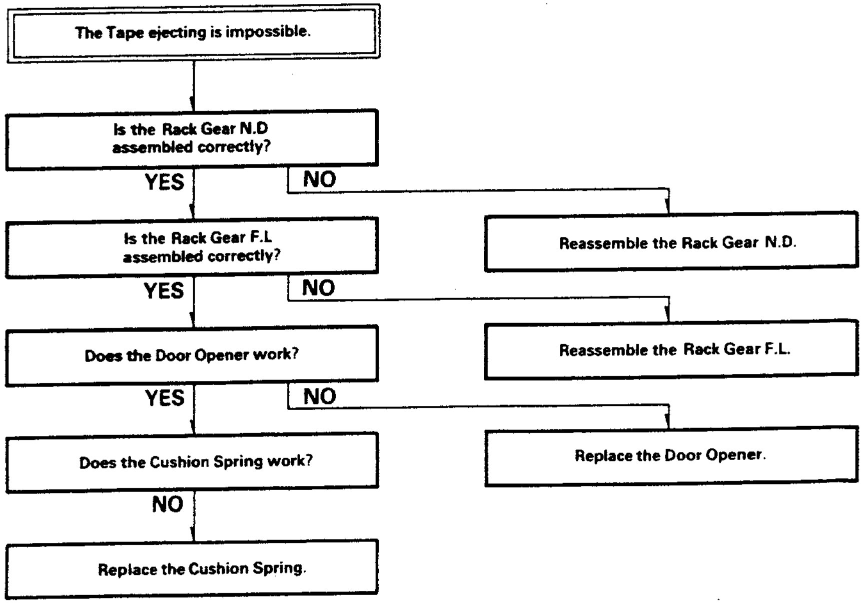

The Tape loading is impossible.
Is the Cassette Tape properly inserted?
YES
NO
Refer to "Cassette Loading is impossible"
Is the assembling position of the Front Loading Mechanism correct?
YES
NO
Reassemble the Front Loading Mechanism.
Are the assembling conditions of Cam Mode and Gear Rack T/FL correct?
YES
NO
Reassemble the Cam Mode, Gear Rack F/R.
Are the assembling conditions of Rack T Gear and Loading Gear correct?
NO
YES
Reassemble the Rack-T and Gear Loading.
1. Does the Gear Loading Assembly(L),(R) spin smoothly?
2. Confirm whether the Loading Gear(L), (R) is contact with other parts during operation.
YES
NO
Replace the Loading Gear Assembly.
Check that the T/Up Arm is fixed by stopper when the pinch Gear is Lower down.
YES
NO
Reassemble the T/Up Arm and Lever T/UP.
Is the Idler Gear separated from the Supply Reel?(Confirm whether the Capstan Motor turns or not)
NO
1. Confirm the conditions of Clutch Bracket ASS'Y and Reel Belt.
2. Replace the Capstan Motor.

2. Front Loading Mechanism

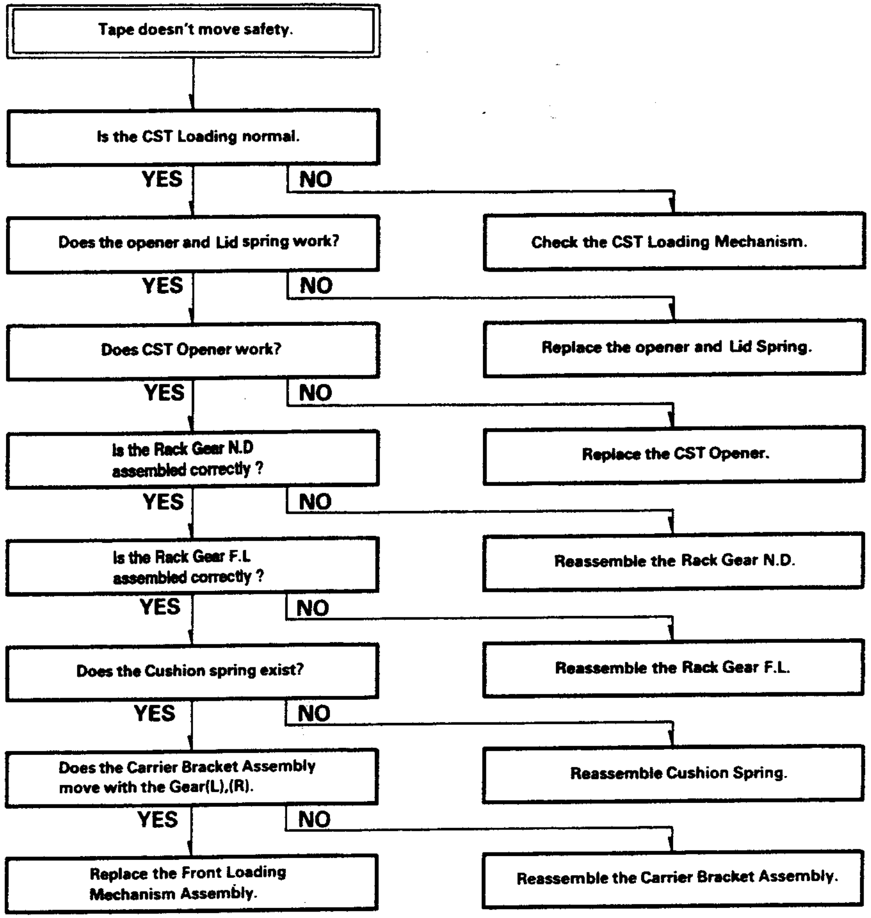
A.


Cassette Loading is impossible.
Does Lever switch work normally?
YES
NO
Is 5V applied to the Vcc of Junction PCB assembly.
NO
NO
Is the switch spring damaged or omitted?
YES
YES
Is 5V applied to the CST switch Terminal of connector.
Replace or add the switch spring.
YES
NO
Check the Syscon part.
Replace the CST switch.

B.


The Tape ejecting is impossible.
Is the Rack Gear N.D assembled correctly?
YES
NO
Is the Rack Gear F.L assembled correctly?
Reassemble the Rack Gear N.D.
YES
NO
Does the Door Opener work?
Reassemble the Rack Gear F.L.
YES
NO
Does the Cushion Spring work?
Replace the Door Opener.
NO
Replace the Cushion Spring.

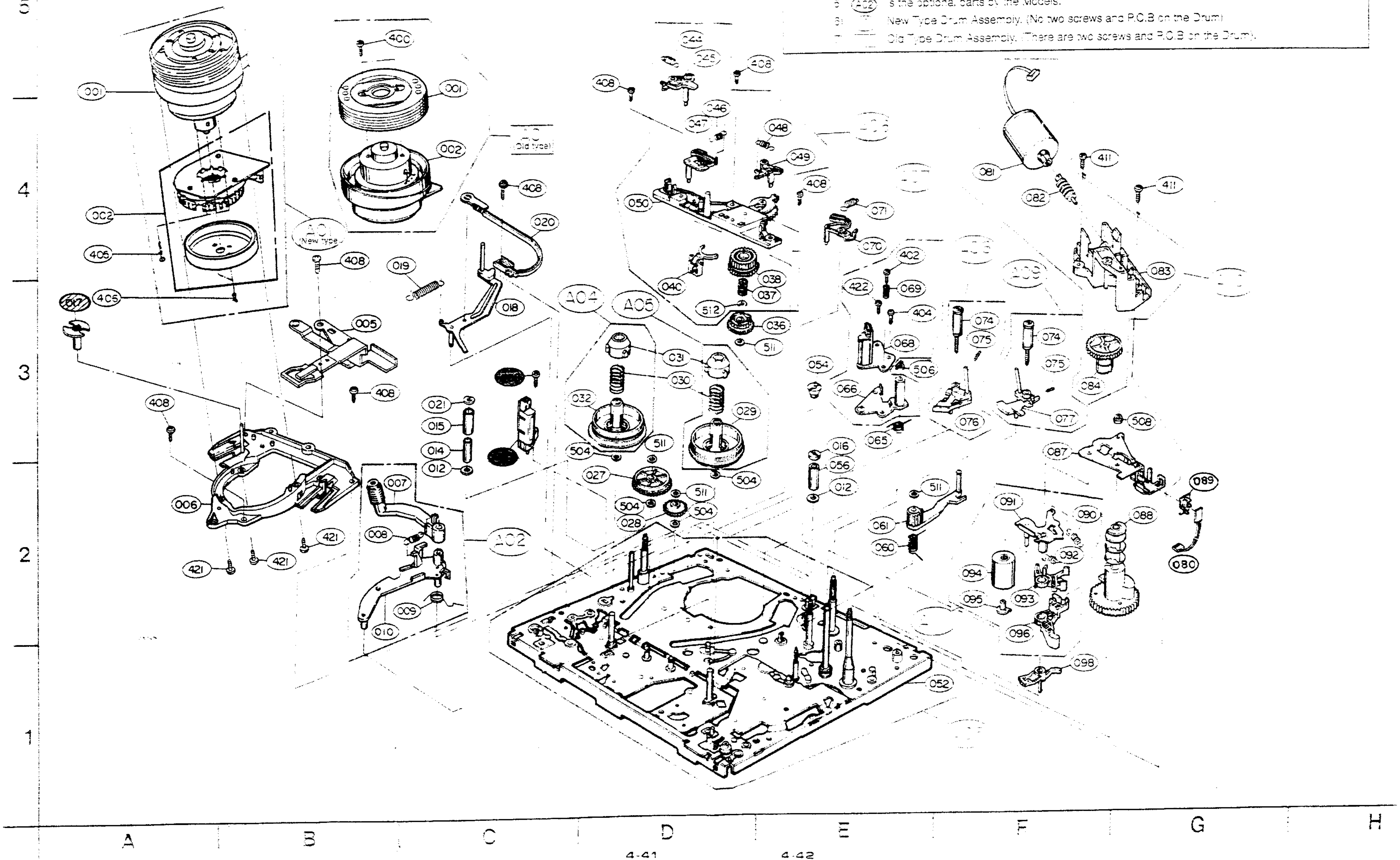
C.


Tape doesn't move safety.
Is the CST Loading normal.
YES
NO
Does the opener and Lid spring work?
Check the CST Loading Mechanism.
YES
NO
Does CST Opener work?
Replace the opener and Lid Spring.
YES
NO
Is the Rack Gear N.D assembled correctly ?
Replace the CST Opener.
YES
NO
Is the Rack Gear F.L assembled correctly ?
Reassemble the Rack Gear N.D.
YES
NO
Does the Cushion spring exist?
Reassemble the Rack Gear F.L.
YES
NO
Does the Carrier Bracket Assembly move with the Gear(L),(R).
Reassemble Cushion Spring.
YES
NO
Replace the Front Loading Mechanism Assembly.
Reassemble the Carrier Bracket Assembly.

EXPLODED VIEW

1. Moving Mechanism Section(I)

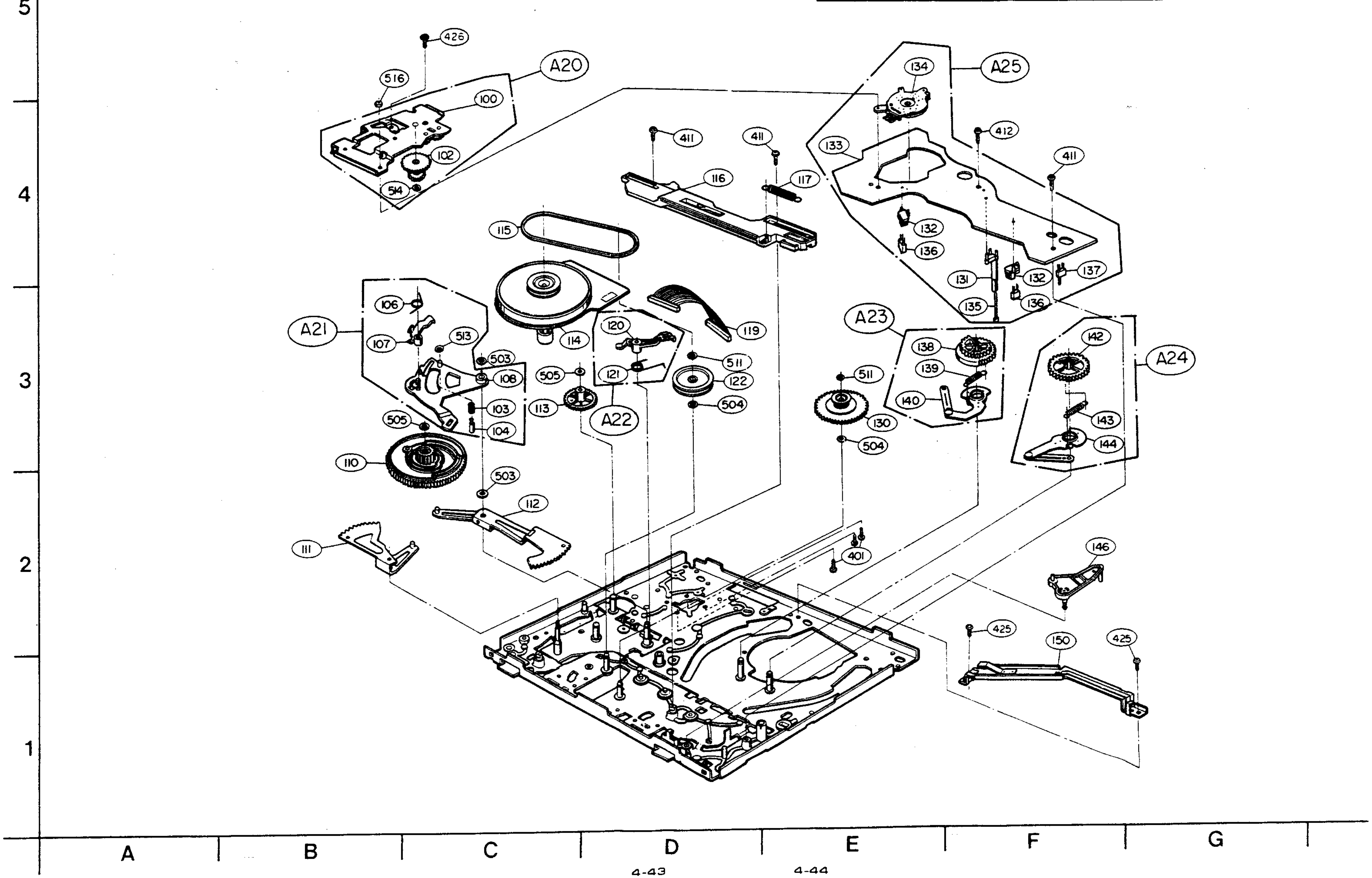
NOTE: 1. Refer to "SECTION 5 REPLACEMENT PARTS LIST" in order to look for the part number of each part.
2. marks the optional parts only in VCR (Video Cassette Recorder) Models.
3. marks the optional parts only in VCP (Video Cassette Player) Models.
4. marks the optional parts only in Hi-Fi Models.
5. (A02) is the optional parts by the Models.
6. New Type Drum Assembly. (No two screws and P.C.B on the Drum)
7. Old Type Drum Assembly. (There are two screws and P.C.B on the Drum).



5
4
3
2
1
A
B
C
D
E
F
G
H
001
400
001
002
A01 (Old type)
002
A01 (New type)
405
405
017
408
005
019
020
408
018
408
408
006
421
421
421
021
015
014
012
007
008
A02
009
010
A04
A05
031
030
032
029
504
511
027
511
504
504
504
028
044
045
408
408
046
047
048
049
408
050
040
038
037
512
036
511
071
070
402
422
069
404
068
506
054
066
065
074
075
074
075
076
077
084
081
411
411
082
083
016
056
012
511
061
060
508
087
089
091
090
088
092
094
095
093
096
080
098
052

2. Moving Mechanism Section(II)

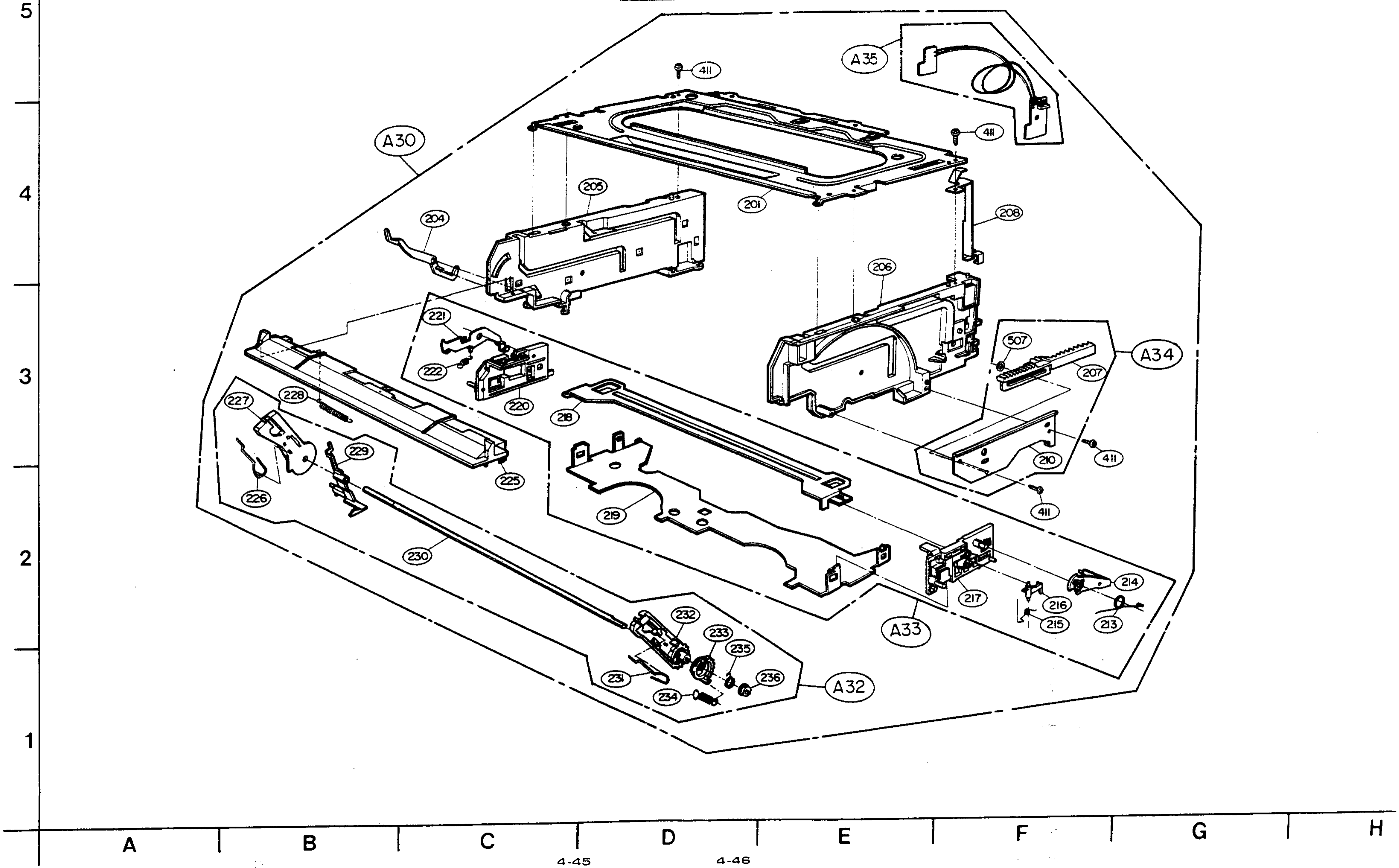
NOTE) 1) Refer to "SECTION 5 REPLACEMENT PARTS LIST" in order to look for the part number of each part.
2) ⑪⑨ is the optional parts by the Models.



A20
426
516
100
102
514
411
411
116
117
A25
134
412
133
411
132
136
131
132
137
135
136
115
114
119
A21
106
107
513
503
108
103
104
505
110
120
121
505
113
A22
511
122
504
A23
138
139
140
511
130
504
A24
142
143
144
503
112
111
401
146
425
150
425
5
4
3
2
1
A
B
C
D
E
F
G

3. Front Loading Mechanism Section

NOTE! 1) Refer to "SECTION 5 REPLACEMENT PARTS LIST" in order to look for the part number of each part


5
4
3
2
1
A30
A35
411
411
201
205
204
208
206
221
222
220
218
507
A34
207
210
411
411
227
228
229
225
226
219
230
217
214
216
215
213
A33
232
233
235
236
231
234
A32
A
B
C
D
E
F
G
H

SECTION 4-2. 8 mm DECK MECHANISM

PERIODICAL CHECK AND MAINTENANCE

For the normal operation and the protection of Tape, the periodical checking and maintaining is required like the unit.
Perform the following steps after the adjustment without the used time.

1. ROTARY DRUM ASSEMBLY CLEANING

Stick the smooth swab moistened with the cleaning water fast to the rotary Drum Slightly, and then rotate the Rotary Upper Drum with a finger to the counter-clockwise slowly.

NOTE :
Be careful so the Motor is not to rotate the Drum and not to rotate to the clockwise. Do not use the swab moistened with the cleaning water to the Head Vertically.

2. TAPE LOADING COURSE CLEANING

Set the Cassette Compartment to the Eject State or remove it, and then wipe the Tape loading Course (No. 1 Guide~No. 7 Guide Capstan Shaft, Pinch Roller) with the Chamois Leather Moistened in cleaning water.

3. DRIVE SYSTEM CLEANING

Wipe the Drive System (Timing Belt, Surface of Reel Table etc.) with the Chamois Leather moistened in cleaning water.

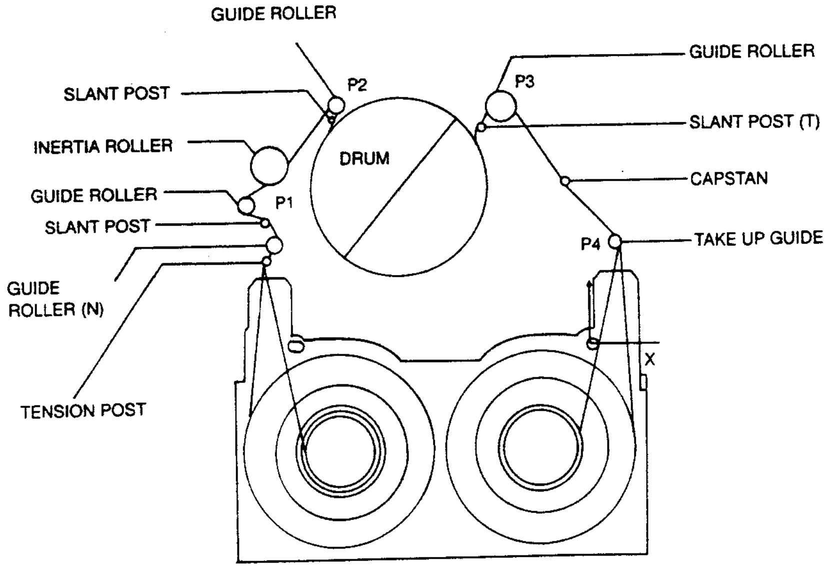

GUIDE ROLLER
SLANT POST
INERTIA ROLLER
GUIDE ROLLER
SLANT POST
GUIDE ROLLER (N)
TENSION POST
P2
P1
DRUM
GUIDE ROLLER
P3
SLANT POST (T)
CAPSTAN
TAKE UP GUIDE
P4
X

Fig. 4-1-1

4. MAINTENANCE TIME TABLE

○Cleaning ◎Oiling ☆Checking

Check Parts		Time (Hours) (H)										Remarks
		500	1,000	1,500	2,000	2,500	3,000	3,500	4,000	4,500	5,000	
Cleaning and Demagnetizing	Tape path surfaces Cleaning	○	○	○	○	○	○	○	○	○	○	Be careful about oil
	Rotary drum assembly Cleaning and demagnetizing	○	○	○	○	○	○	○	○	○	○	Be careful about oil
Drive System	Relay belt	–	☆	–	☆	–	☆	–	☆	–	☆	
	Capstan shaft	–	◎	–	◎	–	◎	–	◎	–	◎	Be careful about that the Oil do not drop on the surface of Tape Path
	Idler pulley axle	–	◎	–	◎	–	◎	–	◎	–	◎	
	Loading Motor	–	☆	–	☆	–	☆	–	☆	–	☆	
Performance Check	Abnormal noise	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	
	Brake tension Measurement	–	☆	–	☆	–	☆	–	☆	–	☆	
	Brake system	–	☆	–	☆	–	☆	–	☆	–	☆	
	FWD, RVS torque Measurement	–	☆	–	☆	–	☆	–	☆	–	☆	

NOTE :
During checking the Unit, refer the Time Table above for the parts change etc.

Oiling :
- Use the regular Oil always. (If the unregular oil is used, the Unit may get demaged.)
- Apply the clean oil on the position used the shaft bearing.
- "Oil 1 drop" means the quantity of degree hanged to the end of 2mm Stick with diameter. (Refer to Fig. 4-1-2)

Grease :
- Use the regular Grease.

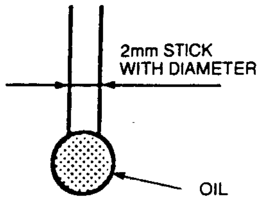


Fig. 4-1-2

DECK MECHANISM DISASSEMBLY AND REASSEMBLY

1. Front Loading Mechanism

1-1. Housing Ass'y Disassembly

1) Disassembly (Fig. 4-2-1)
   (1) Set the unit to the ULC Mode (Unloading Mode).
   (2) Remove 4 Screw(1) on the upper part and then remove the Housing Ass'y CST.

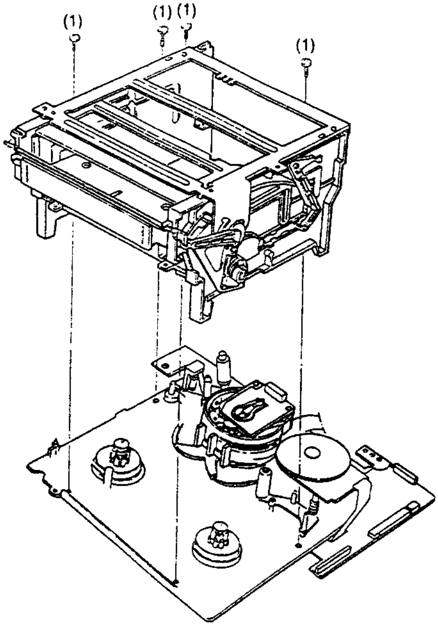


Fig. 4-2-1

2. DC MOTOR (Capstan motor) ASS'Y

2-1. Disassembly (Fig. 4-2-2)

(1) Set the Unit on the ULC Mode (Unloading).
(2) Remove the DC Motor Ass'y by releasing 3 Screws(3) on the lower part of the Chassis.

2-2. Reassembly (Fig. 4-2-2)

(1) Engage the Capstan Gear with the conversion Gear by fixing the 2 Guider bosses and 3 Guider Holes on the Upper part of Chassis into the 2 Guider Holes on the Capstan Gear.
(2) Set the DC Motor Ass'y with 3 Screws(3) on the Lower part of Chassis.

NOTES :
- Use the about 2kgfcm Torque to fix Screw.
- Do not engage with the Gears by forces, because the Capstan Gear is easy to get demaged.
- Stick the DC Motor fast to the Chassis completely.
- Do not touch the Capstan motor Axle, Oil Seal and Rotor.

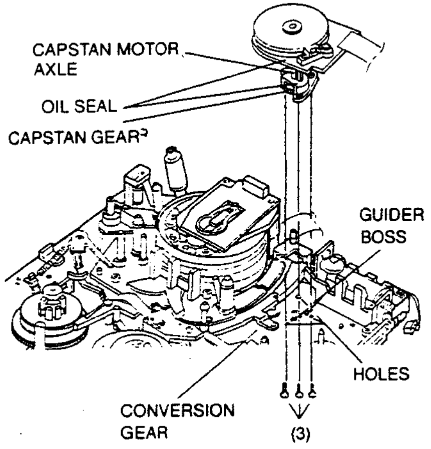


Fig. 4-2-2

3. PINCH ARM ASS'Y AND PINCH LEVER ASS'Y

3-1. Disassembly (Fig. 4-2-3)

(1) Set the Unit to the ULC Mode.
(2) Remove the Pinch Arm Ass'y by removing the stopper Washer.
(3) Remove the Pinch Lever Ass'y.

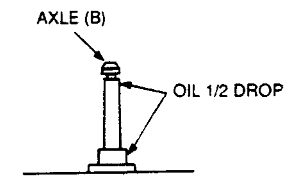

AXLE (B)
OIL 1/2 DROP

Fig. A

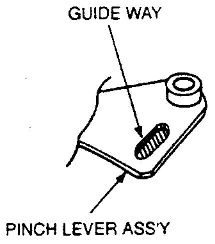

GUIDE WAY
PINCH LEVER ASS'Y

Fig. B

3-2. Reassembly (Fig. 4-2-2, 4-2-3)

(1) Apply Oil 1/2 drop to the Axle(B) 2 point.
(2) Apply greese in the in side of Guide on the Pinch Lever Ass'y (Fig. B).
(3) Stick the Axle(A) of Pinch Lever Ass'y in the Axle B and assemble so the Roller is to be approached to the Guide Way.
(4) Assemble so the Pinch Lever Ass'y pin is sticked in the ⓐ point by inserting the Pinch Arm Ass'y Axle(C) in the Axle (reassembling state).
(5) Set the Stopper Washer.

NOTES :

- Be careful the Nut is not to touch the Rubber Roller when reassembling the Pinch Arm Ass'y to Axle.
- Be careful the object material is not to stain the outer surface of Rubber Roller.

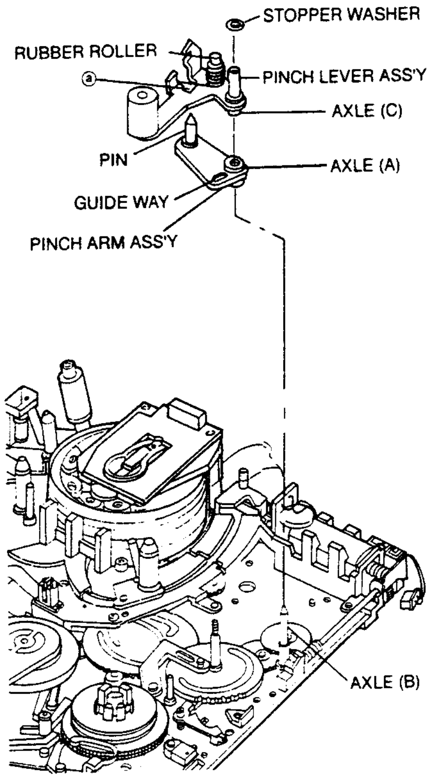

STOPPER WASHER
RUBBER ROLLER
ⓐ
PINCH LEVER ASS'Y
AXLE (C)
PIN
AXLE (A)
GUIDE WAY
PINCH ARM ASS'Y
AXLE (B)

Fig. 4-2-3

4. TAKE UP ARM ASS'Y

4-1. Disassembly (Fig. 4-2-4)

(1) Set the Unit to the ULC Mode.
(2) Remove Nut(A) by using the (-) Driver.
(3) Remove Nut(B) by using the exclusive Driver.
(4) Remove the Slide Washer.
(5) Remove the Take Up Arm Ass'y. At this time, remove after the Spring Arm ⓐ point is to be supported to the Vertical Bending part ⓑpoint of Take Up Arm Ass'y.
(6) Remove the Spring.

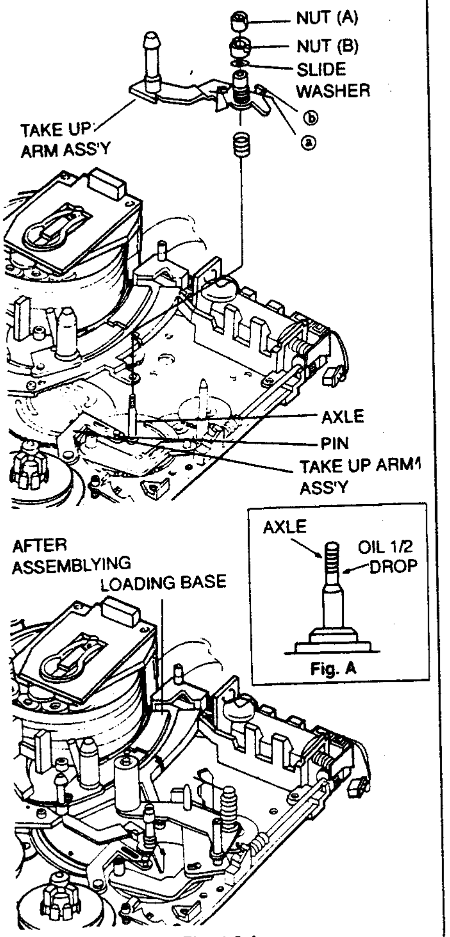

NUT (A)
NUT (B)
SLIDE WASHER
TAKE UP ARM ASS'Y
ⓑ
ⓐ
AXLE
PIN
TAKE UP ARM ASS'Y
AFTER ASSEMBLYING
LOADING BASE
AXLE
OIL 1/2 DROP
Fig. A

Fig. 4-2-4

4-2. Reassembly (Fig. 4-2-4)

(1) Apply the Oil 1/2 drop on the Axle.
(2) Assembly the Compression Spring, Take Up Arm Ass'y, Slide Waher, Nut(B) and Nut(A) to the Axle.
(3) Strain the Spring Arm ⓐ point of Take Up Arm Ass'y to the front to be stopped by sticking in the in side of Take Up Lever Ass'y Pin.

4-3. Take Up Arm Ass'y Height Adjustment

(1) Adjust to 3mm the height between the Cassette install standard side of Loading Base and the Frange Upper side of Take Up Arm Ass'y.

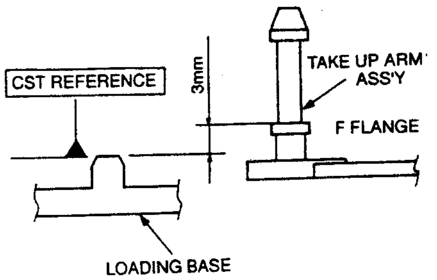

CST REFERENCE
3mm
TAKE UP ARM ASS'Y
F FLANGE
LOADING BASE

Fig. B

NOTES :

- Do not force the Spring Arm unreassembly during disassembly and reassembly, it may cause the transformation of spring.
- Readjust the Take Path after reassembly.

5. MODE LEVER ASS'Y and TAKE UP LEVER ASS'Y

5-1. Disassembly (Fig. 4-2-5)

(1) Set the Unit to ULC Mode.
(2) Remove the Stopper Washer and then remove the Mode Lever Ass'y.
(3) Remove the Stopper Washer and then remove the Take Up Lever Ass'y.

5-2. Reassembly (Fig. 4-2-4, 4-2-5)

(1) Apply the Grease in the CAM trace ⓐ of Mode Gear.
(2) Apply the Oil 1/2 drop to the Axle.
(3) Stick the Mode Lever Ass'y pin in the CAM trace ⓐ of Mode Gear and then assemble the Mode Lever Ass'y to the Axle(A).
(4) Set the Stopper Washer.
(5) Apply the Oil 1/2 drop to the Axle(B).
(6) Stick the Take Up Lever Ass'y pin in the CAM trace ⓑ of CAM Gear and then assemble the Take Up Lever Ass'y to the Axle.
(7) Set the Stopper Washer.

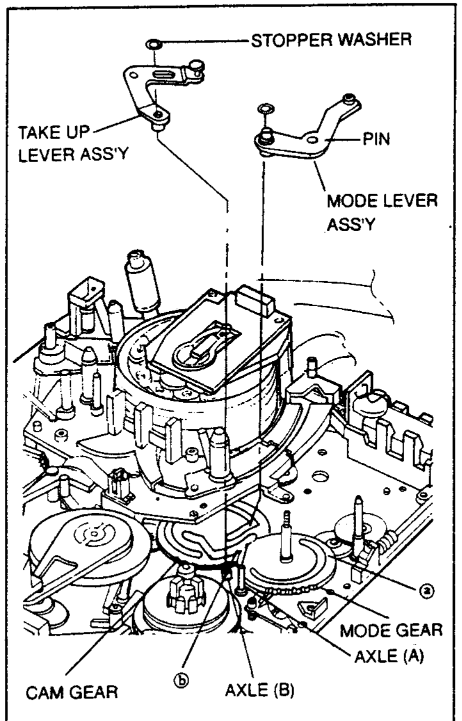


Fig. 4-2-5

6. SOFT BRAKE ASS'Y AND T/BAND PROTECT

6-1. Disassembly (Fig. 4-2-6)

(1) Set the Unit to the ULC Mode.
(2) Hook the Spring Arm point ⓒ stuck in the Vertical Bending part point ⓑ on the Upper part of Chassis to the Spring hanger of Soft Brake Ass'y.
(3) Remove the Stopper Washer and then remove the Soft Brake Ass'y.
(4) Release the Screw and remove the T/Band Protect.

6-2. Reassembly

(1) Stick the T/Band Protect in the Sensor Bracket point ⓐ.
(2) Set the Screw to point ⓐ using the (+) Driver.
(3) Set the Soft Brake Ass'y to the Axle.
(4) Set the Stopper Washer.
(5) Assemble the Spring Arm point ⓒ stuck in the Soft Brake Ass'y supports the Vertical Bending part point ⓑ on the upper part of Chassis.

NOTES :

- Use the about 1.2kgf • cm Torque to fix the T/Band Protect Set Screw.
- Do not force the Spring Arm ⓒ unreassembly, it may cause the transformation of Spring.
- During T/Band Protect assembling, be careful the Reel Ass'y Gear not to be denaged.

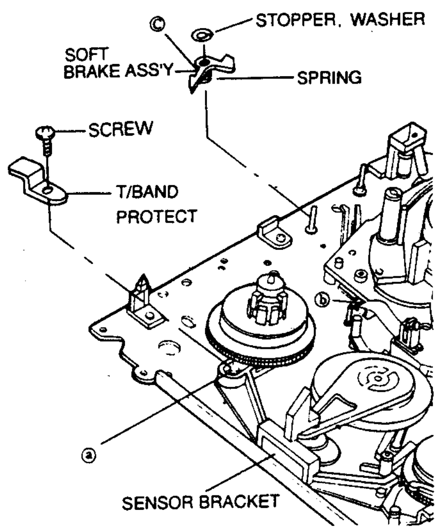


Fig. 4-2-6

7. TENSION REGULATOR ASS'Y AND SLANT ROLLER ARM ASS'Y

7-1. Disassembly (Fig. 4-2-6, 4-2-7)

(1) Set the Unit to the ULC Mode.
(2) Hook the Spring Arm point ⓐ to the Spring Hanger point ⓔ of Slant Roller Arm Ass'y.
(3) Remove the Stopper Washer and the remove the Slant Roller Arm Ass'y.
(4) Remove the Spring Hook of Tension Regulator Ass'y from the Spring Hanger point ⓒ of Bracket.
(5) Remove the Screw using the (+) Drive.
(6) Remove the Stopper Washer and then remove the Tension Regulator Ass'y.
(7) Remove the Slide Washer.

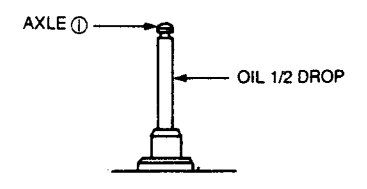


Fig. A

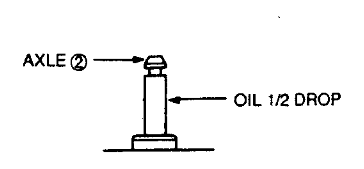


Fig. B

NOTES :

- Be careful so the Band is not to be distarted or folded and the Felt is not to be dirted by an object material during disassembly the Tension Regulator Ass'y.
- Be careful so the Roller surface is not to be dirted by an object material during disassembling the Slant Roller Arm Ass'y.

7-2. Reassembly (Fig. 4-2-7, 4-2-8)

(1) Assemble the Slide Washer to the Axle ②.
(2) Apply the Oil 1/2 drop to the Axle ②.
(3) Assemble the Felt side of T/Band Ass'y with the point ⓕ part of S-Reel Ass'y correctly by sticking the Tension Regulator Ass'y on the Axle.
(4) Assemble the Bracket Guider boss of T/Band Ass'y to accord with the Guide Hole on the upper part of Mechanism Chassis, and then set the Screw.
(5) Assemble the Stopper Washer on the Axle ②.
(6) Put up the Spring Hook at the middle point of Bracket Spring Hanger ⓒ.
(7) Apply the Oil 1/2 drop to the Axle ①.
(8) Assemble the Slant Roller Arm Ass'y on the Axle ①.
(9) Set the Stopper Washer to the Axle ①.
(10) Adjust the position of Tension Regulator FWD.
(11) Put up the Spring Hook ⓑ at the middle Claw of Bracket Spring Hanger ⓒ on the T/Band Ass'y.

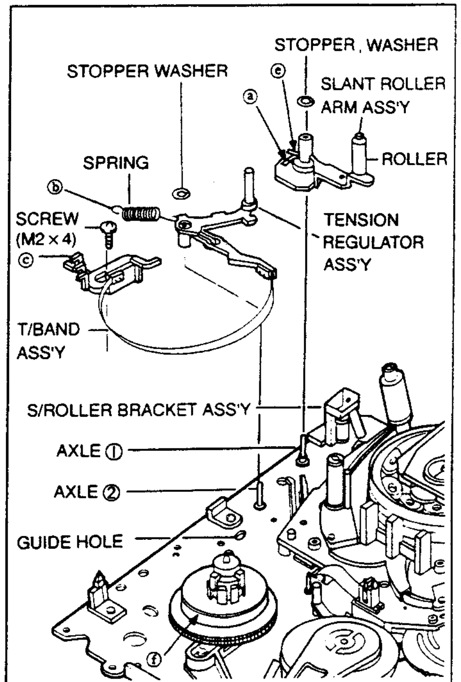


Fig. 4-2-7

NOTES :

- During assembling the Tension Regulator Ass'y, be careful the Band is not to be distorted or folded and the Felt is not to be dirted by an object material.
- Use the about 1.2kgf • cm Torque to fix the Bracket Set Screw.
- During assembling the Slant Roller Arm Ass'y, be careful the Roller surface is not to be dirted by an object material.

8. TENSION REGULATOR FWD POSITION AND BACK TENSION ADJUSTMENTS

8-1. FWD position Adjustment

(1) Set the Unit to the FWD Mode after Loading a Cassette Tape. (Loading make)

(2) Make Sure the gap between the edge of cap on the Tension Regulator Ass'y and the edge of Boss point ⓐ on the Slant Roller Arm Ass'y is 0.5~1mm.
If the gap is over the range, adjust the next step after ejecting the Cassette Tape.

(3) Remove the Set Screw of the Bracket on the T/Band Ass'y.

(4) If the measuring gap is farther than the range, draw the Bracket up to the Direction of arrow Ⓐ, and if the gap is nearer than the range, thrust the Bracket to the direct on of arrow Ⓐ, and then set the Screw.

(5) Check the gap is in the range value by adjusting steps(1), (2) repeatedly.

NOTES :

- Use a Cassette Tape wound about half.

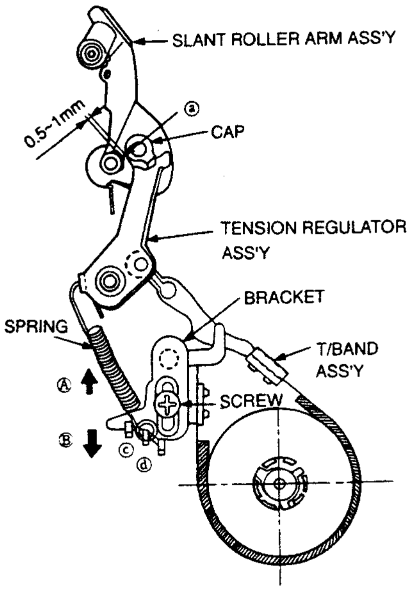


Fig. 4-2-8

8-2. Back Tension Adjustment (Fig. 4-2-8)

(1) Load the Torque Cassette Tape in the Unit and set the Unit to Ope-Mode after step, adjustment. (Forward Play Mode).

(2) Check the Back Tension Torque of the Supply side is in 6.5±2(gf • cm).

(3) Otherwise, adjust the Spring hanger position of Bracket as follows;

(4) If the measurment value is more than the range, put the Spring Hook up to the Hanger ⓒ, and if it is less than the range, put the Spring Hook up to the Hangerⓓ.

(5) Make sure the Back Tension is in the range value by adjusting steps(1), (2) repeatedly.

8-3. Reel Torque Checking

(1) Load the Torque Cassette Tape in the Unit.

(2) Set the Unit to FWD Mode and check the Torque on the T Reel Table is in 12.5±4gf • cm.

(3) Set the Unit to REV Mode and Check the Torque on the S Reel Table is in 12.5±4gf • cm.

(4) Set the Unit REV Mode and Check the Torque on the T Reel Table is in 12.5±4gf • cm.

(5) If each Torque Value is over the range, change the Reel table.

9. WORM GEAR ASS'Y MIDDLE GEAR, TRANS GEAR ASS'Y, LOADING MOTOR ASS'Y AND BRACKET ASS'Y

9-1. Disassembly (Fig. 4-2-9-1, 4-2-9-2)

(1) Remove the Screw for removed the Loading Motor Ass'y (Fig. 2-9-2). At this time, the Worm Gear Ass'y is disassembled simultaneously with the Loading Motor Ass'y ⓐ and Worm Gear Ass'y ⓑ in gear together. (Fig. 4-2-9-1)

(2) Remove the Loading Motor Ass'y and Worm SHAFT Ass'y. (Fig. 4-2-9-1)

(3) Remove the Stopper Washer and remove the Trans Gear Ass'y.

(4) Remove the Stopper Washer and remove the Middle Gear.

(5) Release the Screw to remove the Bracket Ass'y.

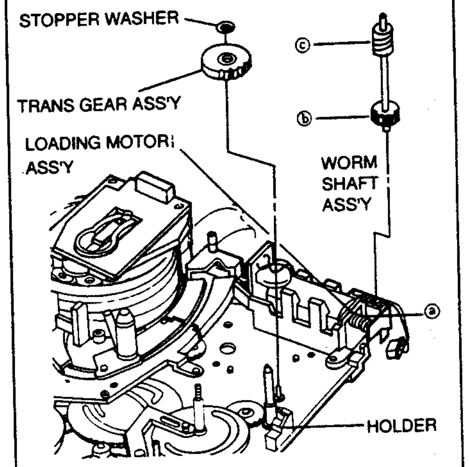


Fig. 4-2-9-1

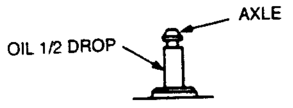


Fig. A

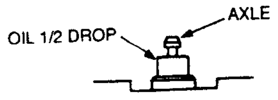


Fig. B

9-2. Reassembly (Fig. 4-2-9-2)

(1) Assemble the Guide Bosses 2 points of Bracket Ass'y to accord with the Guide Holes "ⓐ" and "ⓑ" on the upper part of Mechanism Chassis, and then set the screw.

(2) Apply the Oil 1/2 drop on the Axle.

(3) Go in gear the Mode Gear with Middle Gear by sticking on the Axle.

(4) Set the stopper Washer to the Axle.

(5) Assemble the Guide Bosses 2 points on the Lower part of Loading Motor Ass'y to accord with the Guide Holes "ⓒ" and "ⓓ" on the upper part of Mechanism Chassis and then set the Screw.

(6) After the Gear point ⓑ of Worm Gear Ass'y is to be toward below, stick it into the Gear ⓐ bottom of Loading Motor Ass'y, and fix the Shafe end tip is to be supported to the Loading Motor Bracket first tip, and then assemble the other side of Shaft by pushing from inside of Holder to outside.

(7) Apply the GREASE on the parts. (Fig. C)

(8) Apply the Oil 1/2 drop on the Axle.

(9) Go in gear with the Middle Gear and Worm Gear Ass'y Gear ⓒ together by sticking the Trans Gear Ass'y on the Axle.

(10) Set the Stopper Washer on the Axle.

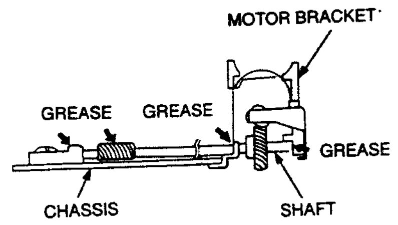


Fig. C

NOTES :

- Do not in gear the Gears by force during disassembly/reassembly of Gear, bited each other.
- During assembling the Bracket Ass'y, be careful the Roller surface is not to be dirted by an object material.
- Use the about 1.2kgf • cm Torque to fix the Screw.

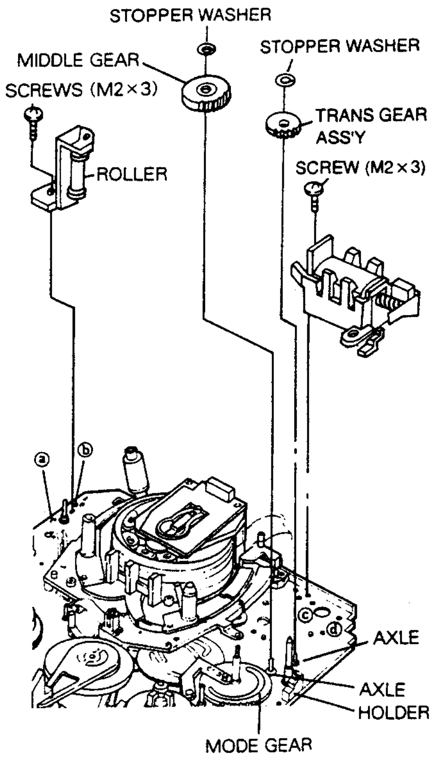

STOPPER WASHER
STOPPER WASHER
MIDDLE GEAR
SCREWS (M2×3)
TRANS GEAR ASS'Y
SCREW (M2×3)
ROLLER
ⓐ
ⓑ
ⓒ
ⓓ
AXLE
AXLE HOLDER
MODE GEAR

Fig. 4-2-9-2

10. LOADING BASE ASS'Y, MODE GEAR ASS'Y AND EJECT LEVER ASS'Y

10-1. Disassembly (Fig. 4-2-10)

(1) Remove the LED Ass'y from the Led assembly Hole of Loading Base Ass'y.
(2) Remove 3 Screws and then remove the Loading Base Ass'y.
(3) Release the Stopper Washer and remove the Mode Gear Ass'y.
(4) Hook the Spring Arm point ⓐ of Eject Lever Ass'y by pushing to the front to the Spring Hanger of Eject Lever Ass'y.
(5) Remove the Stopper Washer and then remove the Eject Lever Ass'y.

NOTES :

- Be careful the Led Ass'y Hook is not to danage during disassembly the LED Ass'y from the Led assembly Hole of Loading Base Ass'y.

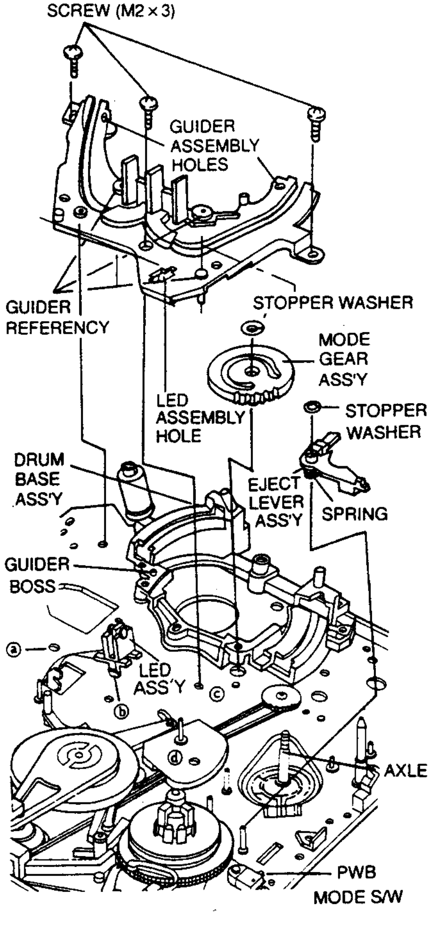

SCREW (M2×3)
GUIDER ASSEMBLY HOLES
GUIDER REFERENCY
STOPPER WASHER
MODE GEAR ASS'Y
LED ASSEMBLY HOLE
STOPPER WASHER
DRUM BASE ASS'Y
EJECT LEVER ASS'Y
SPRING
GUIDER BOSS
ⓐ
LED ASS'Y
ⓑ
ⓒ
ⓓ
AXLE
PWB MODE S/W

Fig. 4-2-10

10-2. Reassembly (Fig. 4-2-10)

(1) Fix the Guide Basic 4 pins of Loading Basse Ass'y to the refuge holes "ⓐ ", "ⓑ", "ⓒ" and "ⓓ" formed on the upper part of Mechanism Chassis. Stick the Pin into the Gear trace of outer Cam formed on the Cam Gear by pushing the Brake Lever Ass'y slightly in the direction of arrow, and then stick the Guide Basic 4 Pins of Loading Base Ass'y fast to Guide 2 Holes by pressing from above to below. (Fig. A)
(2) Set 3 Screws to "T1", "T2" and "T3" on the upper part of Mechanism Chassis.

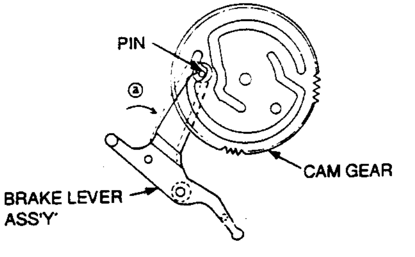

PIN
ⓐ
CAM GEAR
BRAKE LEVER ASS'Y

Fig. A
Brake Lever Ass'y and Cam Gear Assembly

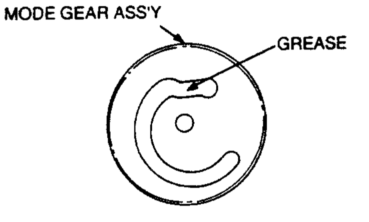

MODE GEAR ASS'Y
GREASE

Fig. B

(3) Assemble the Eject Lever Ass'y on the Axle, and Set the Stopper Washer on it.
(4) Wipe the surface of PWB Mode S/W with the cotton stick with the cleanser.
(5) After the cleanser is dried completely, Apply the Grease to the point of contact evenly and thinly.
(6) Apply the Grease on the Mode Gear Ass'y Cam formative parts.
(7) Go in gear the Cam Gear with the Mode Gear Ass'y by sticking on the Axle. (Fig. C)

(Assembly Method)
Go in gear with together so the intaglioed arrow edge to accord on the line connected to the middle of Mode Gear Ass'y and the middle of Cam Gear.

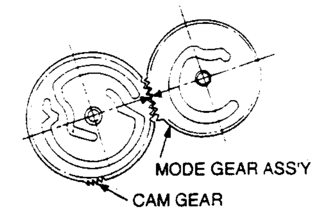

MODE GEAR ASS'Y
CAM GEAR

Fig. C

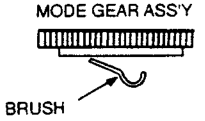

MODE GEAR ASS'Y
BRUSH

Fig. D

(8) Set the Stopper Washer on the Axle.
(9) Push the Spring Arm point ⓐ of Eject Lever Ass'y from the Spring hanger to below to be supported to the sidewall of CST S/W.
(10) Apply the Grease on the deviant lines of Loading Base Ass'y (Fig. 4-2-11).
(11) Stick the Led Ass'y into the Led Ass'y Hold of Loading Bass Ass'y.

NOTES :

- Use the about 1.2kgf • mm Torque to set 3 Screws.
- Do not force unreasonably, during disassembly and reassembly it may cause the transformation of Gear.
- Be careful so the Roller(S), (T) is not to be dirted by an object material.
- Take the Led Ass'y Hook and Loading Base Ass'y not to be transformed during assembling the Led Ass'y to the Led Ass'y Hole of Loading Base Ass'y.
- Be careful so the Brush on the Lower part is not to be transformed during handling the Mode Gear Ass'y (Fig. D).
- Do not gear in the Mode Gear Ass'y and Cam Gear by force during assembling, the Gear parts may get damaged.
- Take the Spring Arm ⓐ of Eject Lever Ass'y not to be transformed by force.

11. GEAR LOADING ASS'Y(S), (T), SLANT BASE ASS'Y(S), (T), CAM GEAR AND LEVER DRIVE ASS'Y

11-1. Disassembly (Fig. 4-2-11-1, 4-2-11-2)

(1) Turn the Loading Base Ass'y over, and remove the part ⓐ of stopper Plate from Pin "D" by raising and then remove the Stopper Plate by Pushing and raising to "A" direction (to above). (Fig. 4-2-11-1)

(2) Remove the Lever Drive Ass'y from Pin "D" on the Loading Base Sub Ass'y.

(3) Turn the Cam Gear to the "L"direction to stop the rotating. At this time the Slant Base Ass'y(S), (T) also move forward because the Loading Gear Ass'y(S), (T) is rotated (Fig. 4-2-11-3).

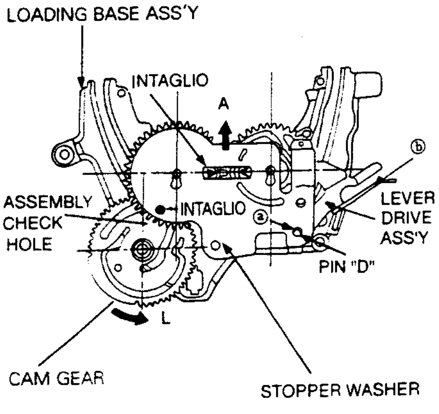
(4) Remove the Loading Gear Ass'y(S) and Slant Base Ass'y(S) from the pin "C" on the Loading Base Sub Ass'y.

(5) Remove the Stopper Washer of Loading Gear Ass'y and disassemble the Slant Base Ass'y(S).

(6) Remove the Loading Gear Ass'y(T) and and Slant Base Ass'y(T) from the pin "B" on the Loading Base Sub Ass'y.

(7) Remove the Stopper Washer of Loading Gear Ass'y(T) and disassemble the Slant Base Ass'y (T).

(8) Remove the Stopper Washer from the pin "A" on the Loading Base Sub Ass'y and disassemble the Cam Gear.


LOADING BASE ASS'Y
INTAGLIO
A
ⓑ
ASSEMBLY CHECK HOLE
INTAGLIO
ⓐ
LEVER DRIVE ASS'Y
PIN "D"
L
CAM GEAR
STOPPER WASHER

THE LOWER PART OF LOADING BASE ASS'Y

Fig. 4-2-11-1

11-2. Reassembly (Fig. 4-2-11-1, 4-2-11-2)

(1) Apply the Oil 1/2 drop on the pin "A" of Loading Base Sub Ass'y. (Fig. 4-2-11-2)

(2) Apply the Grease on the deviant lines of Cam Gear. (Fig. A)

(3) Stick the Cam Gear in the pin "A" of Loading Base Sub Ass'y adn then set the Stopper Washer.

(4) Stick the Slant Base Ass'y(T) and the set theStopper Washer.

(5) Assemble the Cam Gear and Loadilng Gear Ass'y by going in gear together.

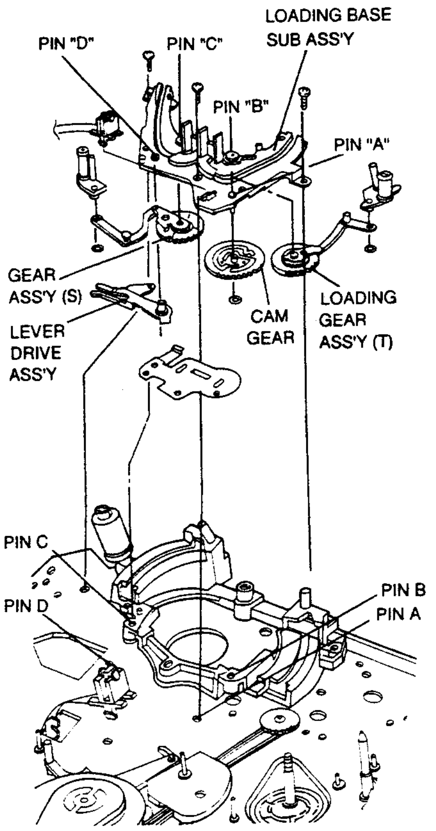

LOADING BASE SUB ASS'Y
PIN "D"
PIN "C"
PIN "B"
PIN "A"
GEAR ASS'Y (S)
LEVER DRIVE ASS'Y
CAM GEAR
LOADING GEAR ASS'Y (T)
PIN C
PIN D
PIN B
PIN A

Fig. 4-2-11-2

(Assembly Method)

Apply the Oil 1/2 drop to the Pin "B". Accord the "assembly basic Hole", on the part unformed the teeth pattern by turning the Cam Gear, with the Guider Hole "E" forned on the Loading Base Sub Ass'y.

Fix the Loading Gear Ass'y(T) in the Pin "B". Accord the Guider Hole "F" in the center of cam Gear and Loading Cam Gear.

In the state, fix the little Gear(A) Teeth in the Cam Gear by pushing the Loading Gear Ass'y(T) from the Upside to the lower. (Fig. 2-11-3). And Check the Guider Hole "G" of Loading Gear Ass'y(T) is placed in the straight line between Pin "B" and Pin "C".

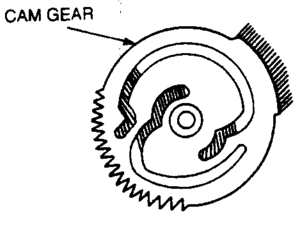


Fig. A

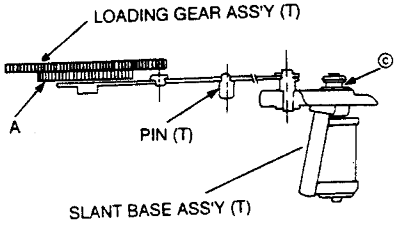

LOADING GEAR ASS'Y (T)
ⓒ
A
PIN (T)
SLANT BASE ASS'Y (T)

Fig. B

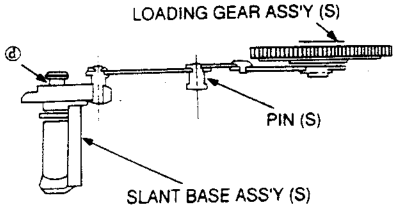

LOADING GEAR ASS'Y (S)
ⓓ
PIN (S)
SLANT BASE ASS'Y (S)

Fig. C

(6) Stick the Pin "T" head of Loading Gear Ass'y(T) in the Guide Way "A" of Loading Base Sub Ass'y. (Fig. 4-2-11-3)

(7) Stick the Slant Base Ass'y(S) in the Lever Hold of Loading Gear Ass'y(S) and Set the Stopper Washer. (Fig. 4-2-11-2)

(8) Apply the Oil 1/2 drop in the Pin "C" of Loading Base Sub Ass'y. (Fig. 4-2-11-2). Go in gear the teeth of Loading Gear Ass'y(S) with the teeth of Loading Gear Ass'y(T).

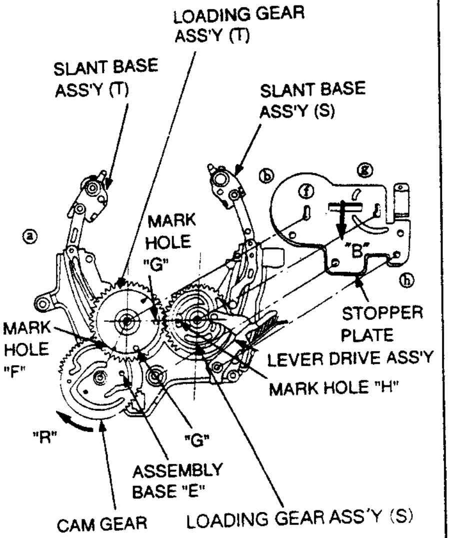

LOADING GEAR ASS'Y (T)
SLANT BASE ASS'Y (T)
SLANT BASE ASS'Y (S)
ⓑ
ⓖ
ⓕ
ⓐ
MARK HOLE "G"
"B"
ⓗ
STOPPER PLATE
MARK HOLE "F"
LEVER DRIVE ASS'Y
MARK HOLE "H"
"R"
"G"
ASSEMBLY BASE "E"
CAM GEAR
LOADING GEAR ASS'Y (S)

Fig. 4-2-11-3

(Assembly Method)

Fix the Loading Gear Ass'y(S) in the Pin "C" and check the Guide Hole "H" is placed in the straght line between Pin "B" and Pin "C", After Assembly, Pin "B", Guider Hole "G", Guider Hole "H" and Pin "C" are placed on the straight line. (Fig. 4-2-11-3)

(9) Stick the Pin(S) Head of Loading Gear Ass'y(S) in the Guide Way "B" of Loading Base Sub Ass'y. (Fig. 4-2-11-3)

(10) Rotate the Cam Gear to the direction of "R" Stick the part "C" of Slant Base Ass'y(T) and part "D" of Slant Base Ass'y(S) in the Guide Way "A" and "B" of Loading Base Sub Ass'y and then rotate the Cam Gear to the direction of "R" until the rotaty is stopped.

(11) Apply the Grease on the deviant Lines of Cam trace formed on the Gear. (Fig. D)

(12) Apply the Oil 1/2 drop in the Pin "D" of Loading Base Sub Ass'y. (Fig. 4-2-11-3)

(13) During sticking the Lever Drive Ass'y in the Pin "D" of Loading Base Sub Ass'y, stick the Pin "L" of Lever Drive Ass'y in the inside of Cam trace on the Loading Gear(S). (Fig. D, part "E")

(14) Apply the Grease on the deviant Lines of Lever Drive Ass'y. (Fig. 4-2-11-3)

(15) Set the Stopper Plate

(16) Turn the Loading Base Ass'y over, and apply the Grease to the deviant lines of the upper part on the Guide Way.

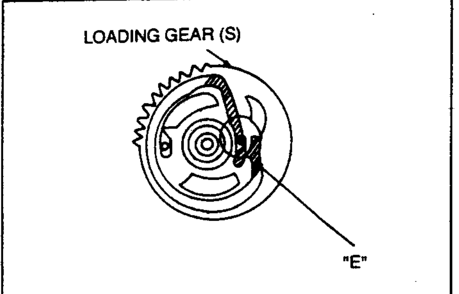


Fig. D

(CHECKING) (Fig. 4-2-11-1)

- Check the Vertical hem of Loading Gear Ass'y(T) negative mark "D" and Loading Gear Ass'y(S) positive mark " " are accorded with each other.
- Check the stopper Plate Guider Hole "I" and Loading Gear Ass'y(T) negative mark "G" are accorded with each other.
- During the checking, if the wrong result is found, adjust the steps above again.

NOTES :

- During the Gears assembly, be careful of the Teeth of Gears get demaged by force.
- Do not force them umreasonably to disassembly and assembly.
- During the Slant and Base Ass'y(C), (T) disassembly and assembly, be careful of the obstruction adhere to the Roller and Post.

12. DRUM BASE ASS'Y AND INERTIA ROLLER ASS'Y

12-1. Disassembly (Fig. 4-2-12) (Fig. A)

(1) Remove 3 Screws and ever remove Drum Base Ass'y.

(2) Remove the Nut.

(3) Remove the Slide Washer, Roller, Sleeve, Lower Flange and Spring.

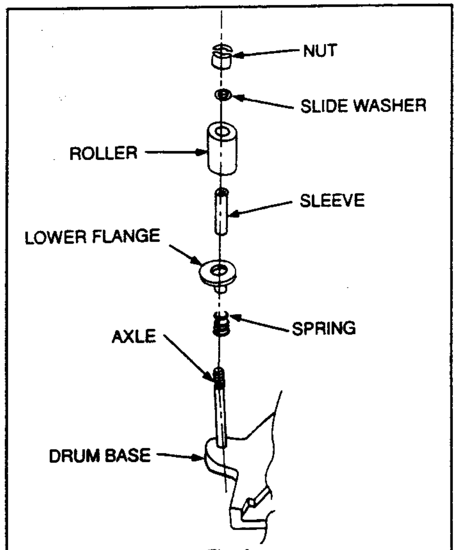


Fig. A

12-2. Reassembly (Fig. 4-2-12) (Fig. A)

(1) Install the Spring, Lower Flange, Sleeve, Roller and Slide Washer on the Axle of Drum Base.

(2) Fix the Axle by rotating the Nut four or six times.

(3) Stick the Guide Bosses 2 point of Drum Base Ass'y in the Boss refuge Holes on the upper part of the Mechanism Chassis from above to below.

(4) Set 3 Screws to fix the Drum Base Ass'y.

NOTES :

- Use the about 2kgf • cm Torque to set Screw.
- Be careful so the Roller surface is not to be dirted during disassembly and assembly.

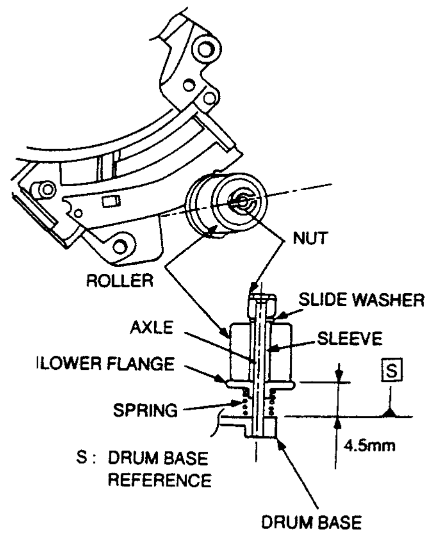


Fig. B

12-3. Roller Height Adjustment (Fig. B)

(1) Adjust the height of Drum Base Lower Side and Lower Frange upper Side by rotating the Nut.

NOTE :

- Readjust the Tape Path after adjustment.

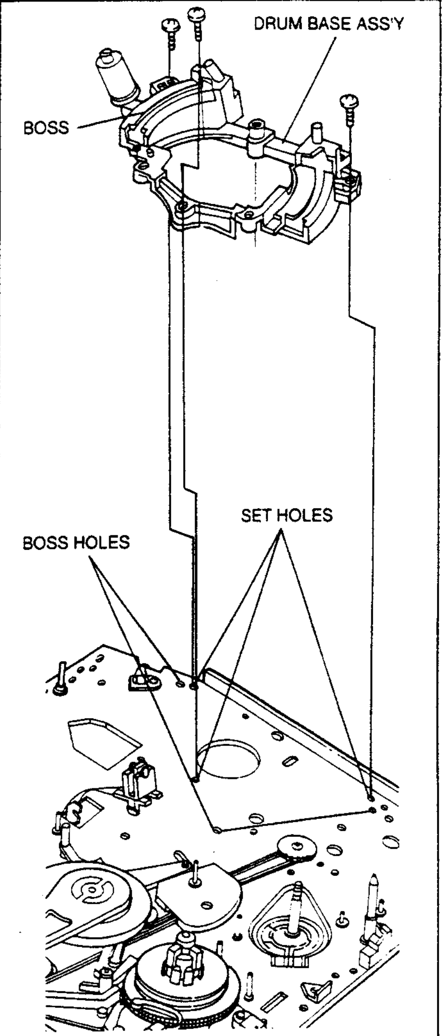


Fig. 4-2-12

13. BRAKE CLUTCH, REEL ASS'Y(S), REEL ASS'Y(T), SENSOR BRACKET, IDLER GEAR ASS'Y AND CAM SPACER

13-1. Disassembly (Fig. 4-2-13)

(1) Remove the Stopper Washer and remove the Brake Clutch.
(2) Remove the Stopper Washer and remove the Slide Washer after disassembly the Reel Ass'y (T).
(3) Remove the Reel Ass'y(S) and then remove the Slide Washer.
(4) Remove the Screw ⓐ and Sensor Bracket.
(5) Disassemble the Idler Gear Ass'y and remove Slide Washer.
(6) Remove the Cam spacer.

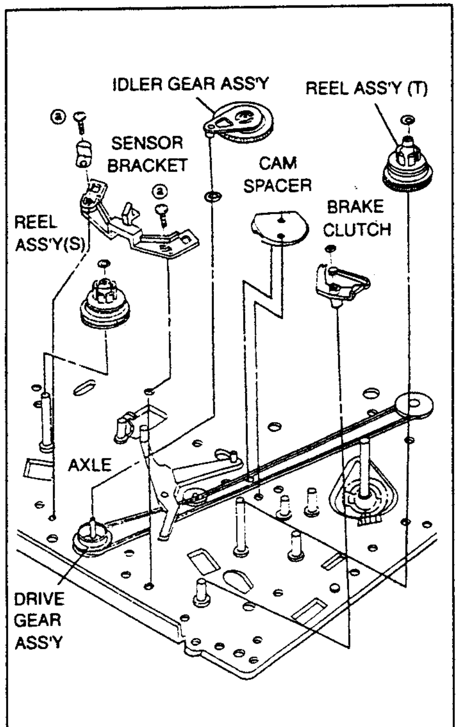


Fig. 4-2-13

13-2. Reassembly (Fig. 4-2-13)

(1) Stick the Guide Bosses 2 point of Cam Spacer in the Guider Bosses 2 point on the upper part of the Mechanism Chassis in the bottom of the Chassis by pushing from above to helow.
(2) Stick the Slide Washer on the Axle and then apply the Oil 1/2 drop and assemble the Idler Gear Ass'y on the Axle. (Fig. A).
During assembling the Idler Gear Ass'y, go in gear the idler Gear teeth with Gear teeth on the upper part of Drive Gear Ass'y.
(3) Stick the Guide Boss 2 point of Sensor Bracket in the Guide Holes 2 point on the upper part of Mechanism Chassis and set right part with Screw.
(4) Push the Spring Arm ⓐ of Brake Reel Ass'y to be supported to the side wall of Sensor Bracket.
(5) Stick the Slide Washer on the Axle and apply the Oil 1/2 drop to the Axle and assemble the Reel Ass'y (S). (Fig. B)
(6) Stick the Slide Washer on the Axle and apply the Oil 1/2 drop to the Axle and assemble the Reel Ass'y(T). (Fig. B)
⇒ Assemble the Reel Ass'y(T) carefully and go in gear the Brake Reel Ass'y teeth with Reel Ass'y (T) teeth by rotating the Lever Brake Ass'y to the direction of "R".
(7) Set the Stopper Washer on the Axle.
(8) Set the Brake Clutch and then the Stopper Washer on the Axle.
⇒ Assemble the bow of Brake Clutch to be Supported to the Side wall of Reel Ass'y(T).

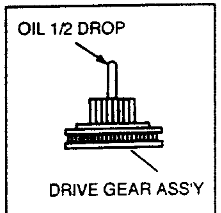


Fig. A

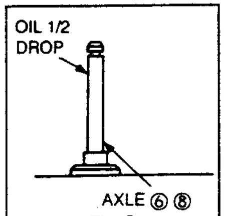


Fig. B

NOTES :

- Be careful so the bow of Brake Clutch is not to be transformed.
- Do not enguage with the Gears by forces, because the Idler Gear is easy to get demaged during the Idler Gear Ass'y.
- Be careful so the teeth is not to get demaged during assembling the Brake Reel Ass'y and Reel Ass'y(T).
- Do not force the Spring Arm unreafonably during the disassembly and reassembly of Spring Arm on the Brake Reel Ass'y, it may cause the transformation of Spring.
- Use the about 1.2kgf • cm Torque to set Screw.

14. BRAKE REEL ASS'Y, LEVER BRAKE ASS'Y, TIMING BELT, IDLER BELT, DRIVE GEAR ASS'Y, CONVERSION GEAR ASS'Y

14-1. Disassembly (Fig. 4-2-14)

(1) Remove the Stopper Washer and remove the Brake Reel Ass'y.
(2) Remove the Timing Belt. Release the Timing Belt stuck in the Idler Belt and then remove the Timing Belt from the Drive Gear Ass'y.
(3) Loosen the Stopper Washer, and remove the Idler Belt and Slide Washer.
(4) Remove the Drive Gear Ass'y and Slide Washer on the Axle.
(5) Loosen the Stopper Washer, and remove the Conversion Gear Ass'y and Slide Washer.

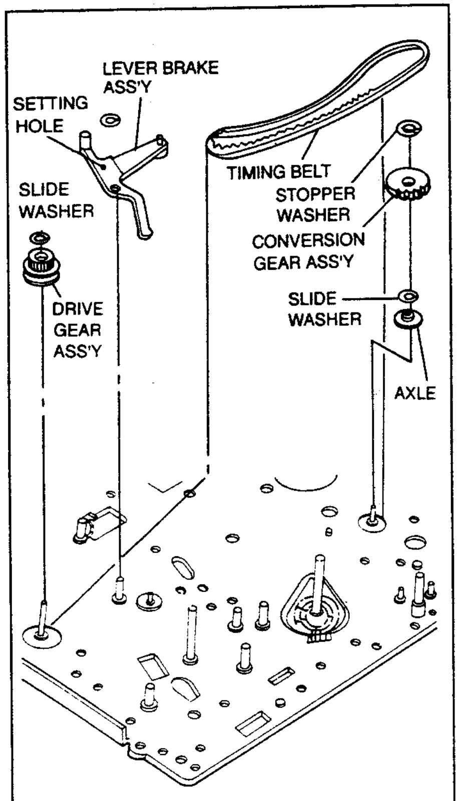


Fig. 4-2-14

14-2. Reaseembly (Fig. 4-2-14)

(1) Stick the slide washer on the Axle and apply the oil 1/2 drop on the Axle. (Fig A)
(2) Assemble the conversion Gear Ass'y on the Axle and set the stop washer.
(3) Assemble the slide wahser on the Axle and apply the oil 1/2 drop on the Axle. (Fig B)
(4) Assemble the Grive Gear Ass'y on the Axle.
(5) Stick the Idler Belt on the Axle and apply the oil 1/2 drop on the Axle.
(6) Assemble the Idler Belt on the Axle and set the stopper wahser.
(7) Assemble the Timing Belt. Hook the Timing Belt on the lower Gear of Conversion Gear Ass'y and assemble the vertical port(no teeth part) on the lower teeth part of Drive Gear Ass'y by hooking on the vertical part of IdlerBelt. (Fig. 4-2-13)
Apply the oil on the teeth of Timing Belt.
(8) Assemble the Lever Brake Ass'y on the Axle and set the stopper washer, and then fit the Guider Hole to the cognition hole by rotating the Lever Brake Ass'y.
(9) Stick the Lever Brake, on the Axle and set the Stopper Washer, At this time, assemble so the part "B" on the Lever Brake Ass'y is to be inserted in the Mouth part "A" on the Brake Reel Ass'y. (Fig. 4-2-13)

NOTE :
Do not force to be transformed unreasonably during the Timing Belt disassembly/assemly.

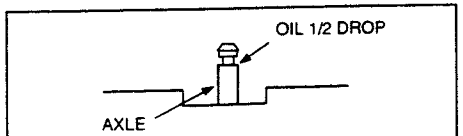


Fig. A

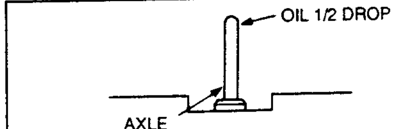


Fig. B

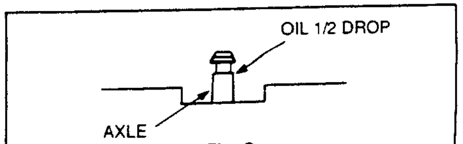


Fig. C

15. DRUM ASS'Y DISASSEMBLY

15-1. Disassembly

(1) Set the Unit to the ULC Mode (Unloading mode).
(2) Remove the Flexible Board and connector.
(3) Loosen the 3 screws on the Lower part of Chassis and remove the Drum Ass'y from the Drum Base Ass'y.

15-2. Reassembly

(1) Fit 2 Guider Bosses formed on the Drum Base Ass'y with the Guider refuge Holde on the Lower part of Drum Ass'y, and then set the Drum Ass'y with 3 screws through the Guide Hole of Drum Base Ass'y on the Lower Part of chassis.
(2) Link the connector to the Flexible Board.

NOTES :

- During the Flexible Board and connector disassembly/assembly, be careful to the Line Cutting or transformation.
- Do not touch the Head Tip.
- Readjust the Tape path of ter assembly.
- Use the about 2kgf • cm Torgue to set screw.

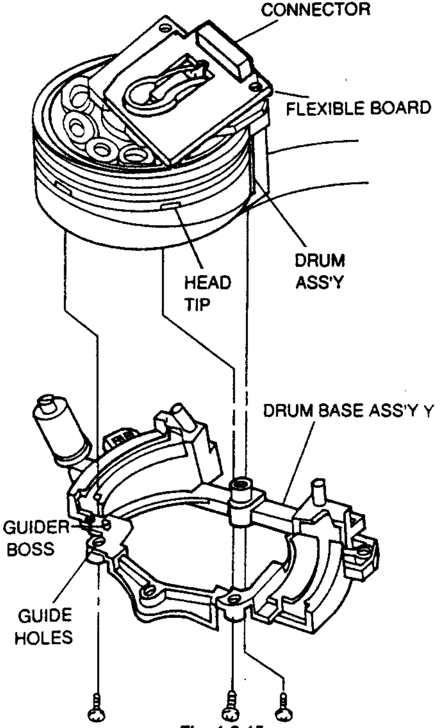

CONNECTOR
FLEXIBLE BOARD
HEAD TIP
DRUM ASS'Y
DRUM BASE ASS'Y Y
GUIDER BOSS
GUIDE HOLES

Fig. 4-2-15

16. DRUM DISASSEMBLY

16-1. Disassembly

(1) Loosen 2Screws on the upper part of Drum Ass'y and remove the Motor Ass'y stator.
(2) Remove the lead from the soldering part on the Lower part of Drum Ass'y, and remove the Plate Signal by loosening 1 Screw.
(3) Remove the lead from the PWB Ass'y signal soldering part on the Lower part of Drum Ass'y and remove PWB Ass'y signal.

16-2. Reassembly

(1) Assemble the Drum to fit the PWB Ass'y signal Hole and the Drum Sub Ass'y pin properly, and solder on the soldering part of PWB Ass'y signal.
(2) Assemble the Plate Signal Ground on the Drum Sub Ass'y with 1 screw, an then Solder on the soldery part of Plate signal Ground.
(3) Assemble the Motor Ass'y Stator in the Bracket Stator Hole with 2 screws on the upper part of Drum Sub Ass'y.

NOTES :

- During the parts assembly, do not scratch on the surface of Drum.
- Be careful so the Video Head is not to be damaged.
- Solder carefully after assembling the PWB Ass'y Signal.
- Use the about 2kgf • cm Torgue to set screw.

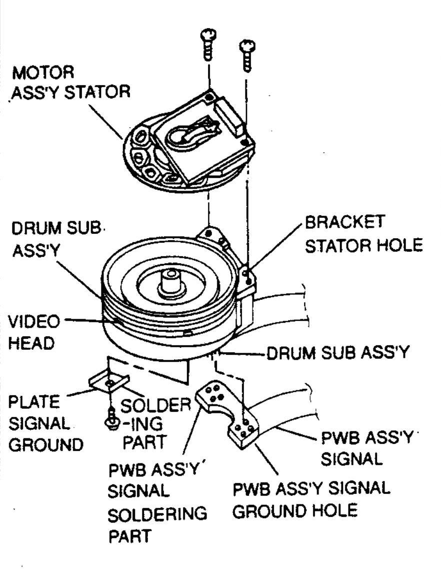

MOTOR ASS'Y STATOR
DRUM SUB ASS'Y
BRACKET STATOR HOLE
VIDEO HEAD
DRUM SUB ASS'Y
PLATE SIGNAL GROUND
SOLDER-ING PART
PWB ASS'Y SIGNAL
PWB ASS'Y SIGNAL SOLDERING PART
PWB ASS'Y SIGNAL GROUND HOLE

Fig. 4-2-16

17. PCB ASS'Y DECK

17-1. Disasembly

(1) Remove 1 screw (4) and 1 screws (5) on the upper parts of chassis.
(2) Remove the Holder PRE-AMP 8 mm, BRACKET DECK 8mm after release, screw (6) and screw (7).
(3) Remove 3 screw (8) and remove the solder of Mode switch, LED.
(4) Remove the PCB ASS'Y DECK JUNTION.

17-2. Reassembly

Perform the reassembly to the reverse order of assembly above.

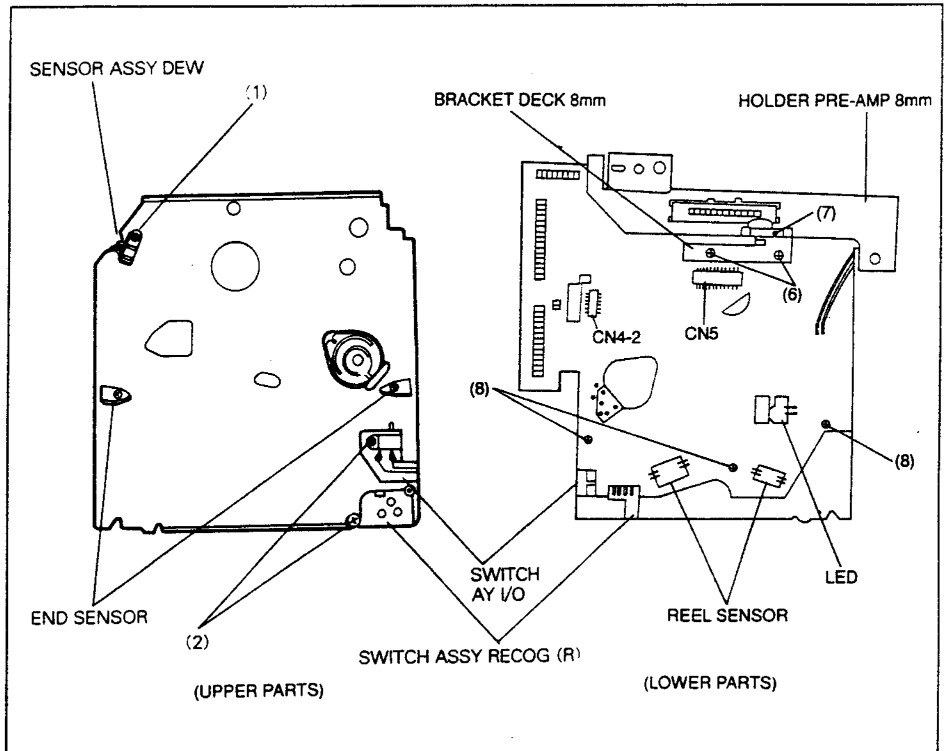

SENSOR ASSY DEW
(1)
BRACKET DECK 8mm
HOLDER PRE-AMP 8mm
(7)
(6)
CN4-2
CN5
(8)
(8)
SWITCH AY I/O
LED
END SENSOR
(2)
REEL SENSOR
SWITCH ASSY RECOG (R)
(UPPER PARTS)
(LOWER PARTS)

Fig. 4-2-17

DECK MECHANISM ADJUSTMENT

1. DECK LOADING SYSTEM LAY-OUT

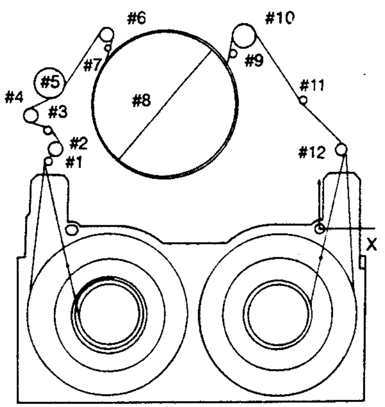

#6
#10
#7
#9
#5
#4
#3
#8
#11
#2
#1
#12
X

Fig. 4-3-1

#1 : TENSION POST (φ2)

#2 : GUIDE ROLLER (N) (φ4)

#3 : SLANT POST (φ2)

#4 : GUIDE ROLLER (φ4)

#5 : INERTIA ROLLER (=P1) (φ8)

#6 : GUIDE ROLLER (S) (=P2) (φ4)

#7 : SLANT POST (S) (φ2)

#8 : DRUM (φ40)

#9 : SLANT POST (T) (φ2)

#10 : GUIDE ROLLER (T) (=P3) (φ6)

#11 : CAPSTAN (φ1.995)

#12 : TAKE UP GUIDE (=P4) (φ3)

2. PREPARATIONS

① Cleaning water.
② Chanois cloth.
③ Cotton stick
④ Dental mirror.
⑤ Torgue CST Tape, Alignment Tape and PLAY/RECORDING Tape.
⑥ Hexagonal Wrench(0.89mm) or L-Wrench.
⑦ Small(-) Driver⇒P1, P4 Adjustment.
⑧ Loading adjustment stick⇒P2, P3, P4 adjustment.
⑨ Circuit jig for Deck adjustment.

3. LOADING POST FIRST HEIGHT ADJUSTMENT

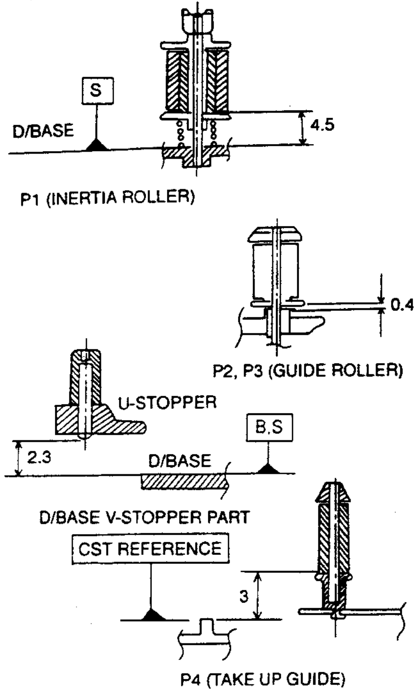

S
D/BASE
4.5
P1 (INERTIA ROLLER)
0.4
P2, P3 (GUIDE ROLLER)
U-STOPPER
B.S
2.3
D/BASE
D/BASE V-STOPPER PART
CST REFERENCE
3
P4 (TAKE UP GUIDE)

Fig. 4-3-2

4. TENTION ARM POSITION AND BACK TENTION ADJUSTMENT

4-1. Tension Arm position Adjustment

(1) Set the Deck mechanism to the Ope-Mode in No Tape state ⇒using the Circuit Fixture.
(2) Check the gab between φ3 Boss of Arm Slant Roller and Cap of Arm Tension is 0.5~1.0 mm. If the gab is over the range, adjust as follows.
(3) Remove the screw on the Bracket fixing the Band Ass'y.
(4) Set the Bracket to the desired position by pushing to the direction of A or B and then set the screw.

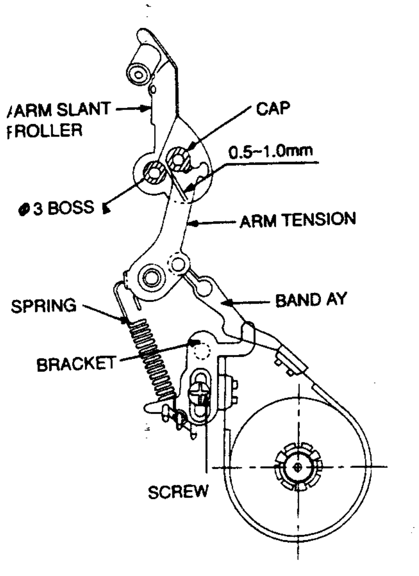

ARM SLANT ROLLER
CAP
0.5~1.0mm
φ3 BOSS
ARM TENSION
SPRING
BAND AY
BRACKET
SCREW

Fig. 4-3-3

4-2. Back Tension Adjustment

(1) After step 4-1 Adjustment, insert the Torgue CST Tape in the Unit and set to the Ope-Mode.
(2) Check the Back Tension Torgue of Supply side is in 6.5±2 (gf-cm).
(3) If the measuring value is more than the range, hook the spring of Bracket to (c), and if the value is less than hook to (D).
(4) Check the Back Tension is in the range by performing the Step 1) and 2) repeatedly.

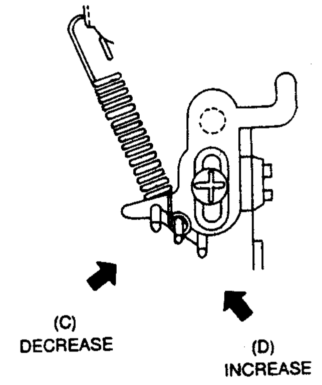

(C)
DECREASE
(D)
INCREASE

Fig. 4-3-4

1-5. REEL TORQUE CHECK

Inset the Torque CST Tape in the unit and check the spec as follows;

MODE	UNIT	SPEC	REMARKS
OPC CUE	gr · cm	12.5±4	At T/up Reel
REVERSE		35±6	At Supply Reel
REVIEW		12.5±4	At T/up Reel

6. TAPE PATH ADJUSTMENT

The 8mm Video can control the Tape speed instantaneously using the pilot signal, and adjusst very correctly using the ATF(Automatic Track Finding) method, so the adjustment by Tracking control knob is not need. But in case of ATF method, the Tape Path adjustment is difficult. That is, the perfect adjustment is difficult through the ATF method, because it compensates the Head Tracking Error to extent. Therefore, select the Track shift Mode for is possible and the Tracking control is easy. NOTE for P4 Guide (# 12) .

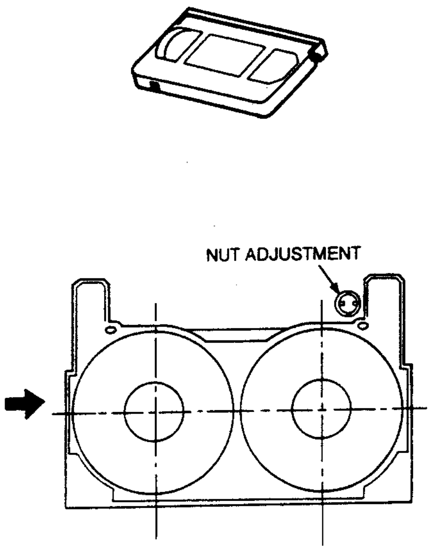


Fig. 4-3-5

6-1. Adjustment preparation

(1) Wipe the Tape path. (Tape Guides, Drum, Capstan Shaft, Pinch Rollor)
(2) Set the oiscilloscope for the Waveform Output.
(3) Play Back the alignment Tape for Tracking control.
(4) Chck the RF Waveform of Oscilloscope in the Entrance/Exit is flat Otherwise, adjust as follows;

- **WAVEFORM**

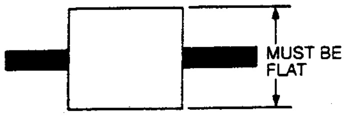


Fig. 4-3-6

6-2. Tracking Control

(1) Playback the Aligment Tape for Tacking contrl.
(2) Using the Running Control stick, rotate the P2-Guide so the waveform of entrance side is to be flatted.
(3) Using the Running control stick, ortate the P3-Guide so the waveform of exit side is to be flatted.

6-3. Tracking Fine Adjustment

(1) Playback the Alignment Tape for Tracking control and set the unit to the Track shift mode.
(2) Check the waveform is flat. Otherwise, roate the P2-Guide and P3-Guide so it is to be flatted.
(3) Set the Lock screw of P2 side using the Hexaponal Wrench 4 L-Wrench, etc. At this time, check the entrance of waveform is not change.
(4) Set the Lock Screw in the P3 side using the hexaponal Wrench 4 L-Wrench, etc. At this time, check the exit side of waveform is not changed.

- **WAVEFORM**

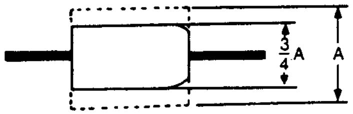


Fig. 4-3-7

6-4. P1-Guide (Inertia Roller) Adjustment

(1) Playback the P6-120MP Tape, and then set the unit to REV Mode.
(2) Check the distortion is occurred in the Lower Flange of P1-Guide. If it appears, bring the Cap of P1-Guide a lower by rotating it to the clock-wise with the driver until the tape is flatted.
(3) Playback the Alignment tape for the Tracking control.
(4) Perform the Tracking Control and Tracking Fine Control.
(5) In the Track Shift state, playback the tape again after CUE/REV. At this time, check the RF Waveform is stabled horizontality in 2secs.
(6) If not, rotate the cap of P1-Guide to an angle of 90 degrees of counter-clockwise and then perform step 5 again.

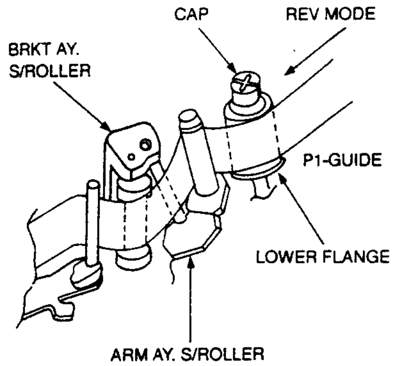


Fig. 4-3-8

NOTES :

① Repeat Step(5),(6) until the normal waveform ranged is become. At this time, if the RF waveform is changed, perform the Track Fine adjustment of Entrance side and then repeat step(5) again.
② Druing FF/REW Mode, check the Curl or Tape Jam are occurred on the # 4 Guide Roller Upper/Lower Flange of Bracket AY, S/Roller.

- **WAVEFORM**

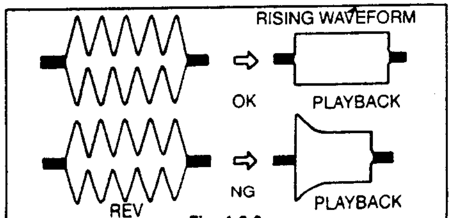


Fig. 4-3-9

6-5. P4-Guide(T/Up Guide) Adjustment

(1) Playback the Alignment Tape for Tracking control and set the unit to the REV-Mode.
(2) Check the Tape transformation is not occurred between the P3-Guide and Capstan Shaft. If it occurrs, rotate the P4-Guide Height Adjustment Cap until the Tape transformation is ridded.
(3) Set the unit to the playback Mode, and then check the Tape transformation is not occurred between the Capstan shaft and P4-Guide(within 0.5mm) If the Tape transformation is more than 0.4mm, adjust the P4-Guide Height unil it is become within 0.5mm.

NOTES :

- When the unit is set to the REV*Mode. it is good adjustment that the transformation between P3-Guide and Capstan Shaft is appeard within 0. 3mm.
- The Upper/Lower Tape Tension distribution in the P2,P3-Guide must be as follows;

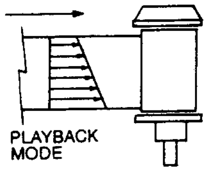


Fig. 4-3-10

6-6. CUE/REV Waveform check

(1) Playback the Alignment Tape for Tracking control and then set the unit to the REV Mode. Check the top of each waveform is sustained with the regular width of 5 or more than 5. Otherwise, perform Item 6-3.
(2) Set the unit to the CUE-Mode. Check otherwise, perform Item 6-3.

- **WAVEFORM**

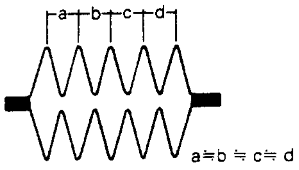


Fig. 4-3-11

6-7. Check after Adjustment

(1) Tracking Check

1) Check the width of RF Wavefrom is reduced to about 3/4 when do the unit set to the Track Shift position.

• WAVEFORM

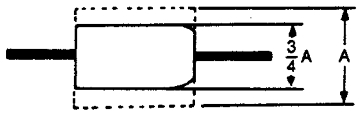


Fig. 4-3-12

2) Check the Minimum width (Emin) is the 65% of Maximum Width (Emax) or more than 65%.

• WAVEFORM

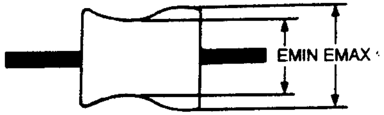


Fig. 4-3-13

3) Check the Waveform is not changed greatly.

(2) Rising Check

1) Playback an Alignment Tape for Tracking Control.

• WAVEFORM

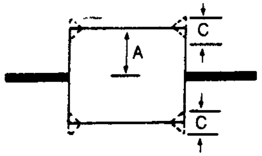
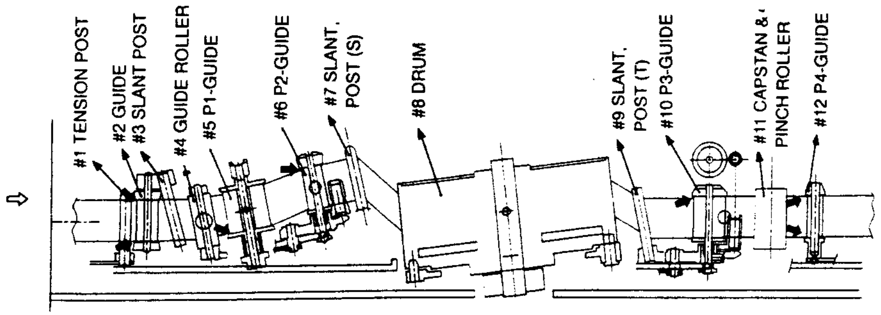


Fig. 4-3-14

2) Release the Tracking Shift State.
3) Unload the tape and load again.
4) Set the Unit to the PLAY mode and check the RF Waveform is stabilized within 2 Secs, horizontally, Also, check the tape is distorted around the Pinch Roller.
5) Set the Unit to the CUE/REV and FF/REW modes and then playing back again, check the RF Waveform is stabilized within 2 Secs, horizontally, Also, check the tape is distorted around the Pinch Roller.
6) Check the process from 3) to 5) repeatedly.

(3) TAPE PATH Adjustment

1) Playback the P_6-120MP (NTSC) or P_5-90MP (PAL) Cassette Tape.
Check the Tape gets on or the Tape folded state is within 0.3mm in the following flanges;
① Upper and Lower Flange of #2 Guide.
② Lower Flange of #5 P1-Guide
③ Upper Flange of #6 P2-Guide
④ Upper Flange of #10 P3-Guide
⑤ Upper and Lower Flange of #12 P4-Guide
2) During Playback Mode, press the FF key to set CUE Mode or press the REW key to set REV Mode, and at this time, check the Tape gets on or the Tape folded state is within 0. 3mm in the following flages.



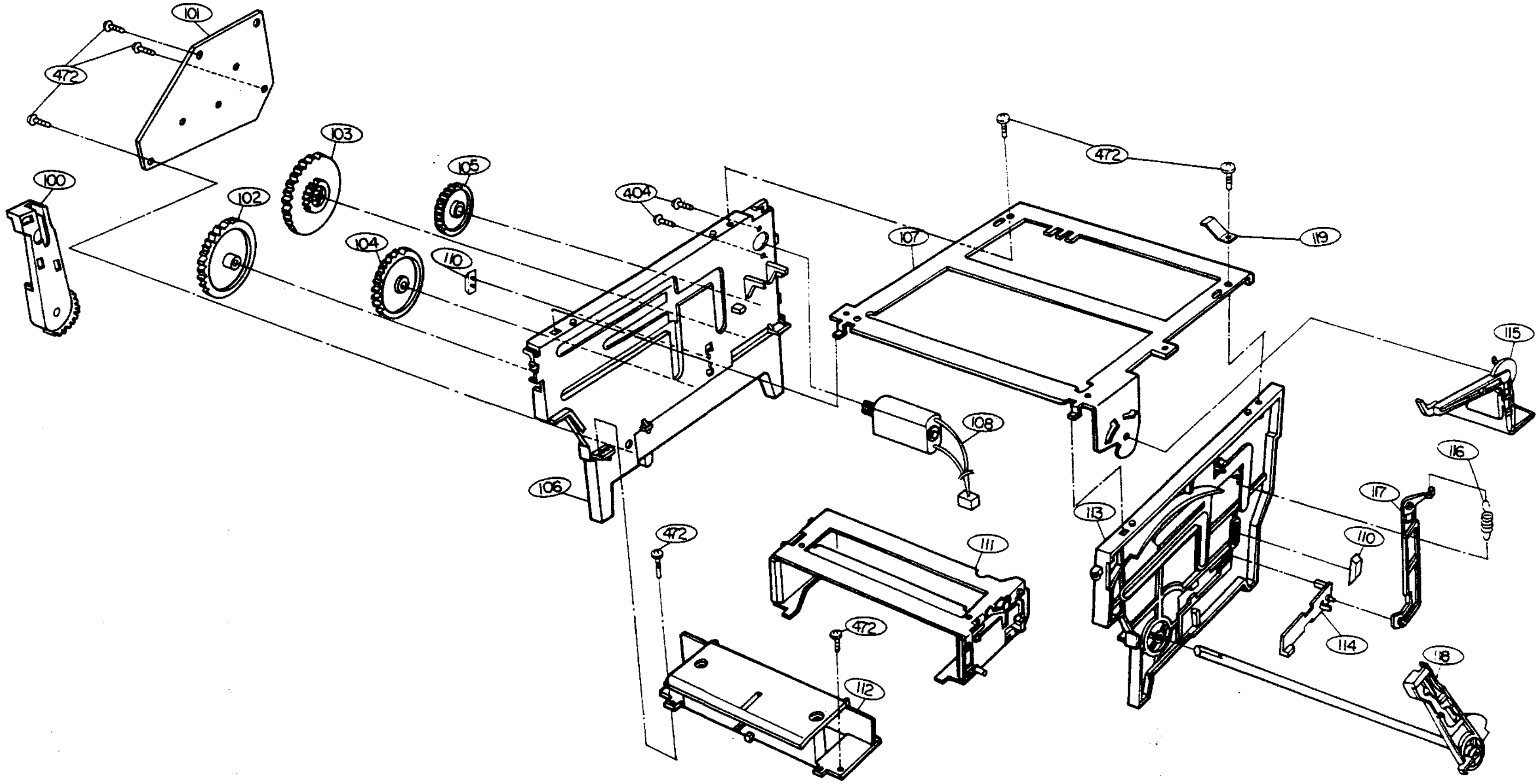
#1 TENSION POST
#2 GUIDE
#3 SLANT POST
#4 GUIDE ROLLER
#5 P1-GUIDE
#6 P2-GUIDE
#7 SLANT. POST (S)
#8 DRUM
#9 SLANT. POST (T)
#10 P3-GUIDE
#11 CAPSTAN &
PINCH ROLLER
#12 P4-GUIDE

Fig. 4-3-15

4. EXPLODED VIEW

4-1. CASSETTE HOUSING SECTION

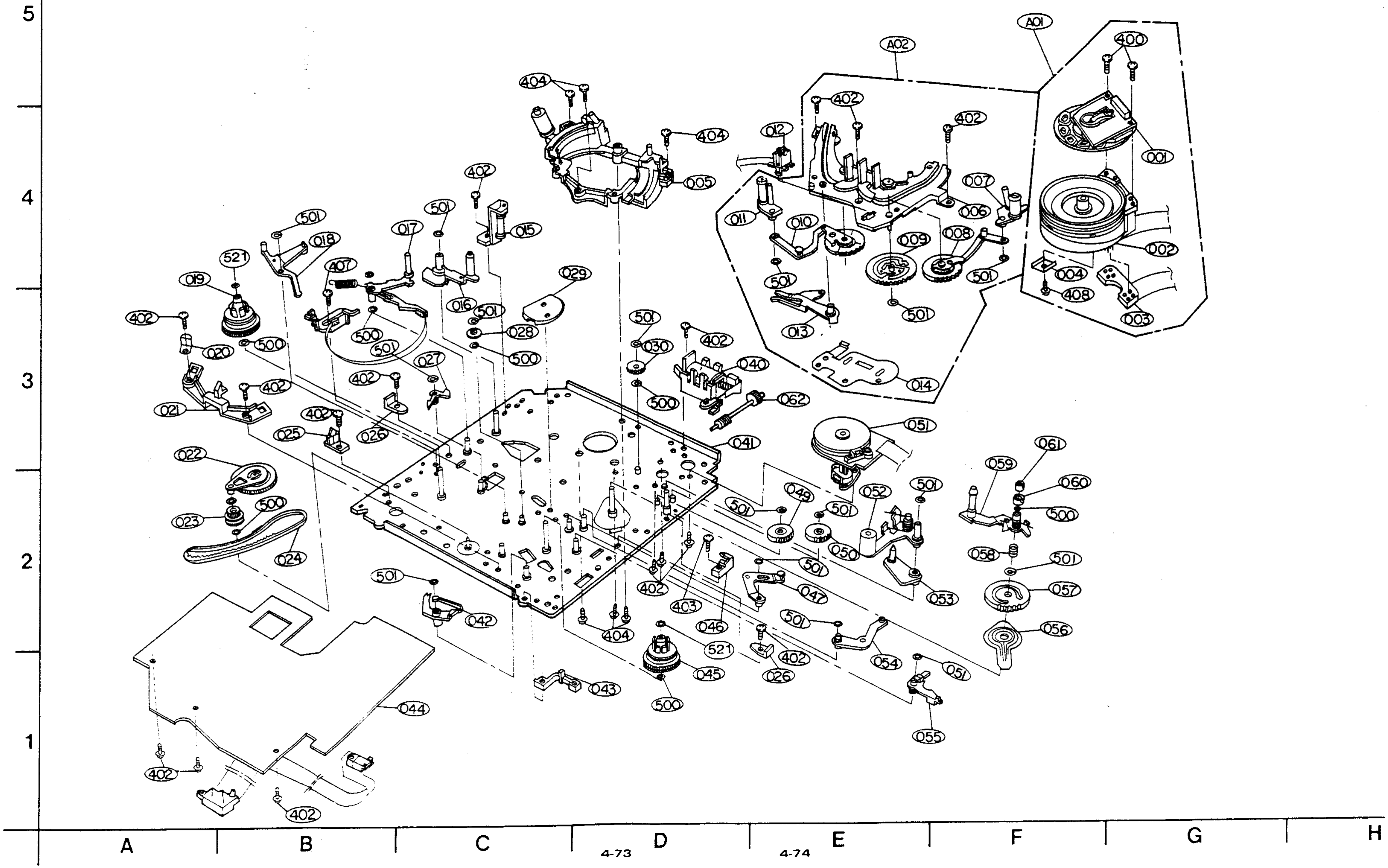
NOTE) 1) Refer to "SECTION 5 REPLACEMENT PARTS LIST" in order to look for the part number of each part.



101
472
100
103
102
105
104
110
404
106
107
472
119
108
115
116
117
113
110
114
472
111
472
112
118
5
4
3
2
1
A
B
C
D
E
F
G

4-2. CHASSIS MECHANISM SECTION

NOTE) 1) Refer to "SECTION 5 REPLACEMENT PARTS LIST" in order to look for the part number of each part.


5
4
3
2
1
A
B
C
D
E
F
G
H
A01
A02
400
001
002
003
004
408
402
012
007
006
011
010
009
008
501
013
014
404
005
402
015
501
017
016
018
521
019
407
029
028
500
020
021
022
023
024
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026
027
030
040
062
041
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061
059
060
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050
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055
403
503

REPLACEMENT PARTS LIST

1. Mechanical Section

RUN-DATE : 93.07.24

1-1. VHS Mechanism

NSP: Not Service Part

S	AL	LOCA.NO	PART NO(GS)	DESCRIPTION	SPECIFICATION	REMARKS
				ASSEMBLY PARTS SECTION		
		A00	412-103E	DECK	ASSY D-17 (G/S)	
		A01	413-303B	DRUM	ASSY D17 F5CH (PAL)	
		A02	386-296B	ARM	ASSY CL	
		A03	311-005G	CHASSIS ASSY'	D17	
	OR	A03	311-005H	CHASSIS ASSY'	D17	
		A04	456-048A	REEL	ASSY S17	NSP
		A05	456-045A	REEL	ASSY T17	NSP
		A06	321-397D	BRACKET	ASSY F/R	
		A07	225-228A	BASE	ASSY A/C	
	OR	A08	225-248A	BASE	ASSY.P2	
		A08	225-248B	BASE	ASSY P2 (W-W)	
	OR	A09	225-249A	BASE	ASSY.P3	
		A09	225-249B	BASE	ASSY P3 (W-W)	
		A10	414-104A	MOTOR	ASSY LOAD	
		A11	333-209E	LEVER	ASSY PINCH	
		A20	321-401A	BRACKET	ASSY BOTTOM	
		A21	333-208A	LEVER	ASSY RAT	
		A22	338-078A	BRAKE	ASSY CAP	
		A23	386-218A	ARM	ASSY LOAD(R)	
		A24	386-219A	ARM	ASSY LOAD(L)	
		A25	511-997B	PWB ASSY	D-17. VCR	
		A30	219-017F	HOUSING	ASSY (D17)	
		A32	435-257B	GEAR	ASSY DRIVE (HOOK ADDED)	
		A33	321-406A	BRACKET	ASSY CARRIER	
		A34	321-441A	BRACKET	ASSY SIDE	
		A35	515-106A	PWB ASSY	SENSOR	
				PARTS SECTION		
		001	413-304B	DRUM	ASSY UPPER (D17-F5CH)PAL	
		002	413-305A	DRUM	ASSY.LOWER (D17-F5CH)	
		005	225-231B	BASE	ASSY D-BRUSH	
	OR	006	225-220A	BASE	DRUM	NSP
		006	225-220B	BASE	DRUM (W-W)	NSP
	OR	006	225-220C	BASE	DRUM (Y-H)	NSP
		007	386-297A	ARM	SUB ASSY CU	
		008	442-460B	SPRING	CU	
		009	442-459A	SPRING	CL	
		010	386-295B	ARM	CL	
		011	442-161A	SPRING	P14	
		012	384-071A	GUIDE	17	
	OR	013	523-082A	HEAD	FE .HVFMF0010AK.D-17	
		013	523-082B	HEAD	FE.HVFHF0010AK	
		014	378-017A	SLEEVE	P1	
		015	434-178A	ROLLER	P1	
	OR	015	434-178B	ROLLER	P1	
		016	389-003B	ADJUST	P(4)	
		018	386-205A	ARM	ASSY TENSION	
		019	442-331C	SPRING	TENSION	

RUN-DATE : 93.07.24

NSP: Not Service Part

S	AL	LOCA.NO	PART NO(6S)	DESCRIPTION	SPECIFICATION	REMARKS
		020	328-052B	BAND	ASSY TENSION	
		021	334-066A	STOPPER	P1	
		027	435-243A	GEAR	IDLE(A)	
		028	435-244A	GEAR	IDLE(B)	
		029	456-040A	REEL	T17	NSP
		030	442-341A	SPRING	REEL	NSP
		031	276-068A	CAP	REEL	NSP
		032	456-039A	REEL	S17	NSP
		036	435-240A	GEAR	F/R	
		037	442-336A	SPRING	UP/D	NSP
		038	435-239A	GEAR	UP/D	NSP
		040	333-201B	LEVER	ASSY F/R	NSP
		044	442-338B	SPRING	SSB	NSP
		045	338-081A	BRAKE	S-SOFT	NSP
		046	442-337A	SPRING	SMB	NSP
		047	338-080A	BRAKE	ASSY S-MAIN	NSP
		048	442-339D	SPRING	TSB	NSP
		049	338-083A	BRAKE	ASSY T-SOFT	NSP
		050	321-396A	BRACKET	SUB ASSY F/R	NSP
		052	313-022A	CHASSIS	OUTSERT	NSP
		054	389-013A	ADJUST	X-ASSY	
		056	378-018A	SLEEVE	P4	
		060	442-343A	SPRING	T/UP	
		061	386-387B	ARM	ASSY T/UP	
		065	442-332A	SPRING	A/C	
		066	225-219A	BASE	SUB ASSY A/C	NSP
		068	523-089A	HEAD	SUB ASSY A/C	
		069	442-362A	SPRING	AZIMUTH	
		070	338-085A	BRAKE	ASSY T-MAIN	
		071	442-344A	SPRING	TMB	
		074	434-173A	ROLLER	ASSY GUIDE	
		075	353-054B	SCREW	MINIATURE	
		076	225-226B	BASE	SUB ASSY S_ALT (L.W-W)	
		077	225-225B	BASE	SUB ASSY S_ALT (R.W-W)	
		081	414-105A	MOTOR	SUB ASSY.:	
		082	437-009A	WORM	ASSY	
		083	321-410A	BRACKET	SUB ASSY L/M	
		084	433-023A	WHEEL	WORM	
		087	321-470A	BRACKET	ASSY DEW	
		088	435-245B	GEAR	PINCH	
	OR	088	435-245D	GEAR	PINCH	
		090	442-347A	SPRING	PINCH	NSP
		091	386-210A	ARM	ASSY PINCH	NSP
		092	442-346A	SPRING	STOPPER	NSP
		093	334-050C	STOPPER	PINCH	NSP
	OR	094	434-181A	ROLLER	ASSY PINCH	
		094	434-181B	ROLLER	ASSY PINCH	
		095	276-089B	CAP	PINCH	NSP
		096	333-203A	LEVER	PINCH	NSP
		098	333-301A	LEVER	T/UP (N)	
		100	321-463A	BRACKET	SUB ASSY E	NSP

RUN-DATE : 93.07.24

NSP: Not Service Part

S	AL	LOCA.NO	PART NO(6S)	DESCRIPTION	SPECIFICATION	REMARKS
		102	435-249A	GEAR	RAT1	NSP
		103	442-356A	SPRING	F-LEVER	NSP
		104	356-208A	PIN	F-LEVER	NSP
		106	442-345A	SPRING	RAT	NSP
		107	333-202A	LEVER	RAT	NSP
		108	333-207A	LEVER	F17	NSP
		110	374-005A	CAM	D17	
		111	435-318A	GEAR	ASSY RACK F/L	
		112	435-291A	GEAR	ASSY RACK T	
		113	435-246A	GEAR	PC	
		114	414-115A	MOTOR	CAPSTAN SVC-102A.D-17	
	OR	114	414-121A	MOTOR	CAPSTAN GVC-017B	
		115	452-047A	BELT	CENTER	
		116	256-734A	PLATE	F17	
		117	442-342B	SPRING	FP	
		119	672-400G	CONNECTOR ASSY	6P 85 (8283-8283) D-17	
		120	338-089A	BRAKE	SUB ASSY CAP	
		121	442-333A	SPRING	CAPSTAN	
		122	432-038A	PULLEY	GEAR	
		130	337-005A	CLUTCH	ASSY	
		131	324-643A	HOLDER	LED	
		132	324-642A	HOLDER	R/S	
		133	515-494B	PWB	JUNCTION D-17	NSP
		134	556-133A	SWITCH	MODE	
	OR	134	556-133B	SWITCH	MODE, ALPS	
	OR	135	0DL451000AA	DIODE LED	IR SENSOR GL451(LONG) SHARP	
		135	0DL550000AB	DIODE LED	IR SENSOR EL-55L(LONG) KOC	
		136	657-102K	SENSOR	SG-105(REEL) KOC	
		137	556-131A	SWITCH	ESE-105SV1	
		138	435-234A	GEAR	LOAD(R)	
		139	442-330A	SPRING	LOADING	
		140	386-274A	ARM	SUB ASSY (R)	
		142	435-235A	GEAR	LOAD(L)	
		143	442-330B	SPRING	LOADING	
		144	386-273A	ARM	SUB ASSY (L)	
		146	333-218A	LEVER	ASSY A-TEN	
		150	321-527A	BRACKET	ASSY C-GUIDE	
		201	256-934B	PLATE	TOP	
		204	465-026A	OPENER	DOOR	
		205	321-517B	BRACKET	LEFT (D17)	
		206	321-518A	BRACKET	RIGHT (D17)	
		207	435-278A	GEAR	RACK N/D	
		208	256-910A	PLATE	GND TOP	
		210	321-440A	BRACKET	SIDE	
		213	442-351A	SPRING	OC	NSP
		214	465-028A	OPENER	CST	NSP
		215	442-357A	SPRING	RID	NSP
		216	465-027A	OPENER	RID	NSP
		217	324-647A	HOLDER	R	NSP
		218	321-407A	BRACKET	SUPPORT	NSP
		219	321-405A	BRACKET	CARRIER	NSP
		220	324-646A	HOLDER	L	NSP

NSP: Not Service Part

S	AL	LOCA.NO	PART NO(GS)	DESCRIPTION	SPECIFICATION	REMARKS
		221	333-210A	LEVER	DT	NSP
		222	442-358B	SPRING	DT	NSP
		225	384-074A	GUIDE	CST	
		226	442-352A	SPRING	L	NSP
		227	435-254A	GEAR	L	NSP
		228	442-350A	SPRING	S/W	
		229	333-204A	LEVER	S/W	NSP
		230	423-368A	SHAFT	D	NSP
		231	442-353A	SPRING	R	NSP
		232	435-255A	GEAR	R	NSP
		233	435-256B	GEAR	C (HOOK ADDED)	NSP
		234	442-359C	SPRING	CUSHION (D17F/L)	NSP
		235	442-354A	SPRING	CC	NSP
		236	276-086A	CAP	DRIVE	NSP
				SCREW		
		400	1MDC0302418	PAN HEAD MACHINE SCREW P/WASH+	D 3.0 L 8.0 MSWR3/FZY	
		401	1MPK0261418	PAN HEAD MACHINE SCREW +.-	D 2.6 L 4.0 MSWR3/FZY	
		402	353-021D	SCREW	SPECIAL	
		404	353-048C	SCREW	CONE POINT 3X10	
		408	1MBC0302418	BINDING HEAD MACHINE SCREW +	D 3.0 L 8.0 MSWR3/FZY	
		411	353-046B	SCREW	SPECIAL (3X8 FZMY)	
		412	1MBC0302818	BINDING HEAD MACHINE SCREW +	D 3.0 L 12 MSWR3/FZY	
		421	1MPC0302618	PAN HEAD MACHINE SCREW +	D3.0 L10.0.MSWR3/FZY	
		422	1MPC0302418	PAN HEAD MACHINE SCREW +	D 3.0 L 8.0 MSWR3/FZY	
		425	1SRF0302418	BRAIZER HD TAP TITE SCREW +	D 3.0 L 8.0 MSWR3/FZY	
		426	1MPC0302018	PAN HEAD MACHINE SCREW +	D 3.0 L 6.0 MSWR3/FZY	
				NUT, WASHER		
		502	354-020D	WASHER	STOPPER	
		503	354-020E	WASHER	STOPPER	
		504	354-001B	WASHER	P.S D3.1XD6X0.5T	
		505	354-080E	WASHER	STOPPER	
		506	352-025A	NUT	NYLON M3	
		507	354-020J	WASHER	STOPPER(2.6X4.8X0.5)	
		511	354-080C	WASHER	STOPPER	
		512	354-080E	WASHER	STOPPER	NSP
		513	354-080A	WASHER	STOPPER	NSP
		514	354-080B	WASHER	STOPPER	NSP
		516	354-033B	WASHER	STOPPER	

1-2. 8mm Mechanism

NSP: Not Service Part

S	AL	LOCA.NO	PART NO(GS)	DESCRIPTION	SPECIFICATION	REMARKS
				ASSEMBLY PARTS SECTION		
		A80	412-132A	DECK	ASSY D-21 (F/L)	
		A00	412-133A	DECK	SUB ASSY D-21 (F/L)	
		A01	413-306A	DRUM	ASSY DD1P	
		A02	225-282A	BASE	ASSY LOADING	
		A30	219-021A	HOUSING	ASSY F/L (D-21)	
				PARTS SECTION		
		001	414-156C	MOTOR	D-21 STATTOR.DRUM DM-21 DD1P	
		002	413-352A	DRUM	SUB ASSY	
		003	515-655B	PWB ASSY	DRUM SIGNAL	
		004	255-148A	PLATE	SIGNAL GROUND	
		005	225-279A	BASE	ASSY DRUM	
		006	225-283A	BASE	SUB ASSY LOADING	
		007	225-285A	BASE	ASSY S/POST(T)	
		008	435-329A	GEAR	SUB ASSY LOADING(T)	
		009	435-327A	GEAR	CAM	
		010	435-332A	GEAR	SUB ASSY LOADING(S)	
		011	225-288A	BASE	ASSY S/POST(S)	
		012	657-031A	SENSOR	ASSY LED	
		013	333-264A	LEVER	ASSY DRIVE	
		014	255-058A	PLATE	L/BASE	
		015	321-535A	BRACKET	ASSY SLANT GUIDE	
		016	386-310A	ARM	ASSY SLANT ROLLER	
		017	386-313A	ARM	ASSY TENSION	
		018	333-254A	LEVER	ASSY BRAKE	
		019	375-015A	DISC	ASSY REEL(S)	
		020	222-019A	PROTECTOR	T/BAND	
		021	321-534A	BRACKET	SENSOR	
		022	386-307A	ARM	ASSY IDLER	
		023	435-323A	GEAR	ASSY DRIVE	
		024	452-054A	BELT	REEL DRIVE (YAMAUCHI)	
		025	322-051A	SUPPORTER	CST	
		026	657-032A	SENSOR	ASSY END	
		027	338-093A	BRAKE	ASSY SOFT	
		028	431-028A	IDLER	BELT	
		029	445-005A	SPACER	CAM GEAR	
		030	435-334A	GEAR	ASSY CONVERSION	
		040	414-137B	MOTOR	ASSY LOADING	
		041	313-041B	CHASSIS	ASSY MAIN(F/L)	
		042	338-104A	BRAKE	CLUTCH	
		043	321-533A	BRACKET	RECOG S/W	
		044	515-680A	PWB ASSY	ASSY JUNCTION	
		045	375-016A	DISC	ASSY REEL(T)	
		046	324-823A	HOLDER	SHAFT	
		047	333-267A	LEVER	ASSY T/UP	
		049	435-321A	GEAR	MIDDLE	
		050	435-348A	GEAR	ASSY TRANSFER	
		051	414-141A	MOTOR	D-21 CAPSTAN MOTOR GSD	

NSP: Not Service Part

S	AL	LOCA.NO	PART NO(6S)	DESCRIPTION	SPECIFICATION	REMARKS
		052	386-319A	ARM	ASSY PINCH	
		053	333-271A	LEVER	ASSY PINCH	
		054	333-269A	LEVER	ASSY MODE	
		055	333-286A	LEVER	ASSY EJECT	
		056	504-476A	PWB	MODE S/W	
		057	435-347A	GEAR	ASSY MODE	
		058	442-486A	SPRING	T/UP ARM(C)	
		059	386-316A	ARM	ASSY T/UP	
		060	352-028A	NUT	T/UP ARM(A)	
		061	352-030A	NUT	T/UP ARM(B)	
		062	423-483A	SHAFT	ASSY WORM(L)	
		100	333-323A	LEVER	ASSY LOADING (L)	NSP
		101	257-058A	PLATE	GEAR	
		102	435-399A	GEAR	A	
		103	435-401A	GEAR	C	
		104	435-400A	GEAR	B	
		105	435-402A	GEAR	D	
		106	225-329A	BASE	SIDE (L)	
		107	257-057A	PLATE	SIDE BASE	
		108	414-162A	MOTOR	ASSY HOUSING	
		110	577-014A	PRISM	END SENSOR	
		111	225-332A	BASE	ASSY LOADING	
		112	257-060A	PLATE	ASSY BASE	
		113	225-328A	BASE	SIDE (R)	
		114	333-319A	LEVER	SWITCH	NSP
		115	333-320A	LEVER	DOOR	NSP
		116	442-593A	SPRING	LOCK(L)	
		117	333-318A	LEVER	LOCK	NSP
		118	333-322A	LEVER	ASSY LOADING (R)	NSP
		119	256-889A	PLATE	CGND	
		342	321-638A	BRACKET	ASSY DECK (8MM)	

SCREW

S	AL	LOCA.NO	PART NO(6S)	DESCRIPTION	SPECIFICATION	REMARKS
		400	353-078B	SCREW	MACHINE+2X9	
		401	353-152A	SCREW	PS (M1.7X2)	
		402	353-153A	SCREW	PS (M2X3)	
		403	353-153B	SCREW	PS(M2X4)	
		404	353-153C	SCREW	PS (M2X5)	
		405	353-153D	SCREW	PS (M2X6)	
		407	353-091C	SCREW	SPECIAL(2X4 BK)	
		408	1MFU0201418	FLAT HEAD MACHINE SCREW PREC 1	D 2.0 L 4.0 MSWR3/FZY	
		415	353-062A	SCREW	STEP	
		472	353-090A	SCREW	SPECIAL TP	

NUT, WASHER

S	AL	LOCA.NO	PART NO(6S)	DESCRIPTION	SPECIFICATION	REMARKS
		500	354-101A	WASHER	SLIDE (1.5TX3.0X0.13)	
		501	354-099A	WASHER	STOP(1.25X3.0X0.25)	
		502	354-104A	WASHER	STOP (2.2X5.0X0.25)	
		520	354-048E	WASHER	PS+D6XD2.6XT0.5	

2. Cabinet & Main Frame Section

NSP: Not Service Part

ASSEMBLY PARTS SECTION

S	AL	LOCA.NO	PART NO(6S)	DESCRIPTION	SPECIFICATION	REMARKS
		A40	315-314D	FRAME	ASSY MAIN (R-DD1P)	NSP
		A41	232-683A	BOARD ASSY	KEY (8MM) DD1P	
		A42	232-682A	BOARD ASSY	TIMER (VHS) DD1P	
		A43	258-597B	PANEL	ASSY DD20P	
		A44	232-680A	BOARD ASSY	POWER DD1P	
		A45	232-685A	BOARD ASSY	PRE-AMP (VHS) DD1P	
		A46	232-679C	BOARD ASSY	MAIN DD20P	
		A47	232-684B	BOARD ASSY	PRE-AMP (8MM) DD10I	

PARTS SECTION

S	AL	LOCA.NO	PART NO(6S)	DESCRIPTION	SPECIFICATION	REMARKS
		250	217-472A	CASE	TOP	
		251	321-526A	BRACKET	HOUSING	
		260	315-300B	FRAME	MAIN	NSP
		261	327-016A	CLAMP	WIRE	NSP
		262	257-061A	PLATE	GND (FTZ)	NSP
		268	324-875A	HOLDER	PCB	
		275	324-872A	HOLDER	DIGITRON	
		280	258-552A	PANEL	FRONT	NSP
		282	226-072B	DOOR	ASSY FRONT R-DD20P	
		283	226-053R	DOOR	CST	
		284	442-469A	SPRING	DOOR	
		286	236-429A	WINDOW	LIGHTING	NSP
		287	236-429B	WINDOW	LIGHTING	
		288	524-007M	MAGNET	ASSY DOOR	
		289	321-492A	BRACKET	ASSY DOOR	
		290	321-490A	BRACKET	ASSY DAMPER	
		291	435-233D	GEAR	DAMPER	
		292	435-301A	GEAR	IDLER	
		303	255-149A	PLATE	HEAT SINK	
		304	221-407A	COVER	FUSE	
		306	324-951A	HOLDER	TRANSISTER	
		307	221-144E	COVER	INSULATION	
		320	258-596A	PANEL	ASSY DISTRIBUTOR	
		321	257-006A	PLATE	BOTTOM GROUND	
		330	221-834A	COVER	BOTTOM	
		340	226-064B	DOOR	CST 8MM R-DD20P	
		341	442-591A	SPRING	DOOR	

SCREW

S	AL	LOCA.NO	PART NO(6S)	DESCRIPTION	SPECIFICATION	REMARKS
		451	353-046C	SCREW	(3X10 FZMY)	
		454	1TRL0402418	BRAIZER HEAD TA SCREW + 2 CUT	D 4.0 L 8.0 MSWR3/FZY	
		456	353-051A	SCREW	SPECIAL	
		458	353-051C	SCREW	SPECIAL(3X12)	
		462	353-136A	SCREW	SPECIAL(FBK)	
		463	1MBC0302418	BINDING HEAD MACHINE SCREW +	D 3.0 L 8.0 MSWR3/FZY	

3. Packing Accessory Section

RUN-DATE : 93.07.24

NSP: Not Service Part

S	AL	LOCA.NO	PART NO(GS)	DESCRIPTION	SPECIFICATION	REMARKS
		801	480-517B	INSTRUCTION ASSY	R-DD20P 3GQ1	
		802	288-614A	BOX CARTON	R-DD20P 3CQ1	
		803	283-217A	PACKING	R-DD1P	
		804	291-002D	SHEET CUSHION	R-DD1P'S	NSP
		808	534-036B	BATTERY	MN2400 ~~AAA~~ SIZE 1PAIR DURACEL	
		810	861-505B	CABLE SET ASSY	RF-CABLE.ASSY.PAL	

4. Remote Control Section

NSP: Not Service Part

S	AL	LOCA.NO	PART NO(GS)	DESCRIPTION	SPECIFICATION	REMARKS
		900	597-089C	REMOTE CONTROL	ASSY R-DD20P	
		901	236-484A	WINDOW	FILTER(R/C)	NSP
		902	221-858C	COVER	DOOR (R/C) R-DD20P	NSP
		903	217-485A	CASE	TOP (R/C)	NSP
		904	275-610C	BUTTON	RUBBER FUNCTION (R/C)	NSP
		905	275-612A	BUTTON	RUBBER VHS (R/C)	NSP
		906	275-611A	BUTTON	RUBBER 8MM (R/C)	NSP
		907	515-824A	PWB ASSY	REMOCON DD1P	NSP
		908	442-611A	SPRING	COIL (R/C)	NSP
		909	217-486A	CASE	BOTTOM(R/C)	NSP
		910	221-857A	COVER	BATTERY	
		911	477-054A	RUBBER	BUMPON	NSP